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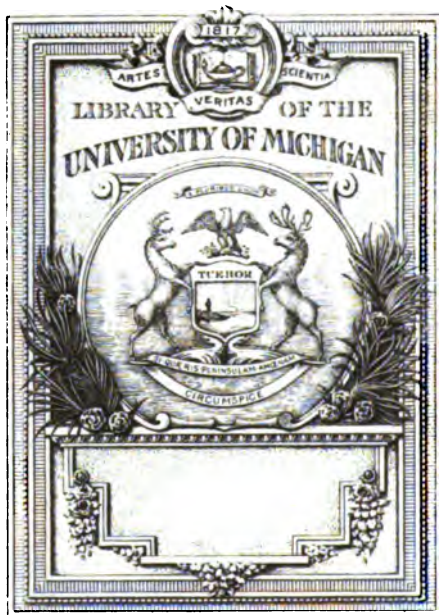
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DOCUMENTS OF THE SENATE

OF THE
STATE OF NEW YORK,
ONE HUNDRED AND TWENTIETH SESSION.

1897.

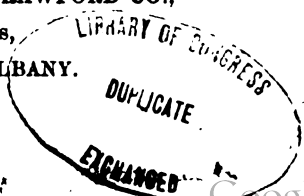
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1897.



University of the State of New York

EXTENSION DEPARTMENT

FOURTH ANNUAL REPORT

1896

TRANSMITTED TO THE LEGISLATURE FEBRUARY 5, 1897 BY THE
REGENTS OF THE UNIVERSITY

ALBANY

UNIVERSITY OF THE STATE OF NEW YORK

1898

Senate, ...
STATE OF NEW YORK
1897
V. 12

No. 46

IN SENATE

FEBRUARY 5, 1897

FOURTH ANNUAL REPORT

OF THE

EXTENSION DEPARTMENT

OF THE

University of the State of New York

To the Legislature of the State of New York.

I have the honor to submit herewith, pursuant to law, the annual report of the Extension department

ANSON JUDD UPSON

Chancellor

Regents

ANSON JUDD UPSON, D. D., LL. D., L. H. D., *Chancellor*

WILLIAM CROSWELL DOANE, D. D., LL. D., *Vice-Chancellor*

FRANK S. BLACK, B. A., *Governor*

TIMOTHY L. WOODRUFF, M. A., *Lieutenant-Governor*

JOHN PALMER, *Secretary of State*

CHARLES R. SKINNER, M. A., LL. D., *Sup't of Pub. Inst.*

} *Ex officio*

In order of election by the legislature

YEAR

1873	MARTIN I. TOWNSEND, M. A., LL. D.	- -	Troy
1874	ANSON JUDD UPSON, D. D., LL. D., L. H. D.	-	Glens Falls
1877	CHAUNCEY M. DEPEW, LL. D.	- - -	New York
1877	CHARLES E. FITCH, LL. B., M. A., L. H. D.	- -	Rochester
1877	ORRIS H. WARREN, D. D.	- - - -	Syracuse
1878	WHITELAW REID, LL. D.	- - - -	New York
1881	WILLIAM H. WATSON, M. A., M. D.	- -	Utica
1881	HENRY E. TURNER	- - - - -	Lowville
1883	ST CLAIR MCKELWAY, M. A., LL. D., L. H. D., D. C. L.	- - - - -	Brooklyn
1885	HAMILTON HARRIS, Ph. D., LL. D.	- - -	Albany
1885	DANIEL BEACH, Ph. D., LL. D.	- - -	Watkins
1888	CARROLL E. SMITH, LL. D.	- - -	Syracuse
1890	PLINY T. SEXTON, LL. D.	- - - -	Palmyra
1890	T. GUILFORD SMITH, M. A., C. E.	- - -	Buffalo
1892	WILLIAM CROSWELL DOANE, D. D., LL. D.	-	Albany
1893	LEWIS A. STIMSON, B. A., M. D.	- - -	New York
1894	SYLVESTER MALONE	- - - -	Brooklyn
1895	ALBERT VANDER VEER, M. D., Ph. D.	- - -	Albany
1897	CHESTER S. LORD, M. A.	- - - -	Brooklyn

Elected by the regents

1888	MELVIL DEWEY, M. A., <i>Secretary</i>	- - -	Albany
------	---------------------------------------	-------	--------

REGENTS STANDING COMMITTEE ON EXTENSION 1897

CHARLES E. FITCH, *Chairman*

CHANCELLOR

WHITELAW REID

GOVERNOR

ST CLAIR MCKELWAY

CHAUNCEY M. DEPEW

PLINY T. SEXTON

CHESTER S. LORD

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University of the State of New York

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REPORT OF EXTENSION DEPARTMENT 1896

FOR THE YEAR ENDING SEPT. 30, 1896

To the regents of the University of the State of New York

I submit herewith the fourth annual report of the extension or home education department in its four divisions of public libraries, extension teaching, summer schools and study clubs.

Public libraries. In the public libraries division, the report (*Extension bulletin* 20) shows that 134 libraries have been visited, of which 62 had not been previously reached. Of these, 20 received University charters within the year, three were admitted with existing charters and 10 others were registered as maintaining a proper standard. 50 of the visited libraries received public library money. There were 19 more inspections than in the previous year.

A new and important part of this work is that of visiting the state hospitals at the request of the commission in lunacy to obtain information on which to act in furnishing books to these institutions under the provision of the 'insanity law' of 1896. After consultation a library of 500 books and 35 periodicals was selected for use in the state hospitals and a list of them was published in classified arrangement as *Extension bulletin* 18.

118 libraries and institutes are now fully incorporated in the University. Three of these were originally chartered by special acts of legislature, 20 were incorporated under general laws and 97 now hold standard University charters, two having been reincorporated. 48 of the charters are provisional for five years from the date of grant indicating that the property, including books, is not yet valued at \$1000. These 118 libraries are located in 47 counties and contain 327,310 volumes, or 68,884 more than in 1895. Their circulation for the year has reached 988,471 volumes.

The rules for granting public money have been formulated during the year and are printed in full on pages 128-30 of the department

report. Under these rules the money available for subsidies was exhausted in May 1896. Of the 29 applications then remaining, 27 of which aggregated \$3942, 15 were approved but filed unpaid till the next fiscal year. If these could have been paid within the year the total grants would have been \$17,688.59 to 118 libraries; an increase of 32 libraries and \$3189.56 over the preceding year. The average payment was \$151 to each library as compared with \$168, \$167 and \$158 in the three preceding years. The amount sufficient in 1893 when 40 libraries were in a position to claim state aid was quite insufficient in 1896 when 118 libraries asked and 154 libraries were entitled to ask the recognition of public service.

The traveling library system continues to be a subject of marked interest both within and without the state. Sample libraries in working order have by request been exhibited in New York city, Newark, N. J., Syracuse, N. Y., Buffalo, N. Y., and Cleveland, O. Book cases as samples have been sent to Philadelphia and to Hampton institute, Va.

Within the state, 253 traveling libraries prepared for general circulation with annotated catalogues and charging outfit have been lent during the year, as compared with 154 lent during the preceding year, a gain of 66%. Besides these 125 libraries including 8275 volumes have been selected and lent to registered centers, clubs and other organizations. The summary of the use of the capitol library shows that 345 readers have drawn out 6845 volumes. No separate record is kept of the use of the books bought for lending to institutions in the University as these are included in the state library reports.

The report of the public libraries division also contains besides these statements of work done a summary of general library interests, showing the progress which has been made in library legislation, the subjects under discussion at the various library conferences of the year, and a list of the best books for 1895 for a village library made up by combining the vote of 15 librarians selected as expert judges. To the report of the division is appended a table giving information in regard to 806 New York libraries with various comparative tabulated summaries, showing a gratifying increase in appreciation on the part of library managers as well as readers,

of the value of public libraries in the educational life of the community.

Extension teaching. The extension teaching division finishes its fifth year of activity in 1896, and while in the beginning this included the only work done by the department it is now coordinate with the important work of the library, study club, and summer school divisions, with a fifth, that of correspondence teaching, to be added as soon as the work demands its separation into an independent division. In order to test the progress of the last five years a series of questions was sent to each local secretary, and the returns offer an instructive study to all who are interested in the local organization of extension centers. This discussion is followed by notes of progress at centers outside New York.

Summer schools. The report of the summer school division calls attention to the growing custom among students and others of literary tastes of spending part of the summer in attendance on special courses of instruction. One new summer school in New York is reported from Lake Placid where a French recreation class for girls is held under the direction of Mlle Debray-Longchamp. A new feature of the summer school bulletin is a list of summer conferences and conventions of 1897 (see *Extension bulletin* 19, p. 67-71) which publication made in May was of interest and service to educators in planning vacation trips. A tabulated report of 251 summer schools is appended to the bulletin.

Study clubs. The study club division reports 122 registered clubs, an increase of 58 during the year. 88 of these clubs borrowed traveling libraries. Three reading circles are also reported, two of which were added during the last year. The reports from the individual clubs are followed by some account of similar work in other states and to this is appended a statistical table giving details in regard to each club reporting. An investigation of this table will show that this division reaches all classes of students and gives help in the study of the most varied subjects. Study club libraries are in use both in the large cities and in small isolated communities, some of the most satisfactory results being attained in remote country villages where the club and the traveling library which it brings are one of the few diversions from the ordinary daily routine.

Publications. The following have not been previously reported :

Extension bulletins. Large O., 25 × 17.5 cm. Alb. 1896. •

Price to advance subscribers, 50 cents a volume.

E13 Summer schools; first annual supplement. 93p. May 1896.

Price 10 cents.

Supplements summer schools bulletin for 1895, giving statistics of 1895 schools and announcements for 1896.

E14 Class list of a \$500 library recommended for schools. 36p.

Sept. 1896. *Price 5 cents.*

Selection of books for reference and general reading. Editions have been carefully chosen with regard to print, paper, editing and cost.

E15 Class list of a \$500 library recommended for schools. 2d edition, revised. 36p. *Price 5 cents.*

Ed. 2 differs from Ed. 1 by a few substitutions and changed prices.

E16 Report of public libraries for 1895 and statistics of New York libraries. Oct. 1896. *Price 15 cents.*

Extension circulars. Large O., 25 × 17.5 cm. Alb. 1896.

C33 Study clubs. 12p. Nov. 1895.

States the aid offered to registered clubs by the study club division of the Extension department.

C34 Lists of extension teachers. 16 p. Feb. 1896.

Supplement to C31.

Extension syllabuses. D. Alb. 1896–date.

Outlines of courses given under direction of the University of the State of New York, containing selected lists of authorities on the subjects treated. *Price to registered centers or clubs 2 cents for each 8 pages; single copies at prices specified.*

S57 Jackson, A. V. W. *Professor of Indo-Iranian languages, and sometime adjunct professor of the English language and literature, Columbia university.* Ancient India and Persia: their literature and their civilization. 24p. Nov. 1895. *Price 5 cents.*

S58 Scott, W. B. *Professor of geology, Princeton university.* Zoologic geography. 14p. Nov. 1895. *Price 5 cents.*

S59 Mills, H. E. *Professor of economics, Vassar college.* The labor problem. 44p. Nov. 1895. *Price 10 cents.*

S60 Rice, R. A. *Professor of history and director of art association, Williams college.* America and Europe in the 18th century. 12p. Dec. 1895. *Price 5 cents.*

- S61 Goodyear, W : H : *Curator of archeology, ethnology and fine arts, Brooklyn institute.* History and criticism of Italian art and of painting by the old masters. 17p. Feb. 1896. *Price 5 cents.*
- S62 McMurry, F. M. *Professor of pedagogics, University of Buffalo.* Pedagogy. 18p. March 1896. *Price 5 cents.*
- S63 Dunning, W : A. *Adjunct professor of history and political philosophy, Columbia university and* Cushing, H. A., *Tutor in history, Columbia university.* European history since 1815 with special reference to the continent. 28p. Aug. 1896. *Price 10 cents.*
- S64 Parmele, Mrs M.. P. Music; its evolutionary development. 14p. July 1896. *Price 5 cents.*
- Traveling library finding lists.* Annotated class lists of libraries for lending to local libraries, communities or extension centers. $7\frac{1}{2} \times 12\frac{1}{2}$ cm. *Price 2 cents each.*
- List 26; Young people's library; 25 miscellaneous volumes each.
- Lists 25, 27; 50 miscellaneous volumes each.

A careful examination of the following pages will give detailed information in regard to the various activities of the department, and will show more fully the recent methods adopted by the state for extending educational advantages liberally, judiciously and economically to its entire body of citizens.

Respectfully submitted

MELVIL DEWEY

Director

University of the State of New York

Extension Bulletin

No. 18 March 1897

PUBLIC LIBRARIES No 5

A LIBRARY OF 500 BOOKS AND 35 PERIODICALS

SELECTED IN 1897 FOR THE

State Commission in Lunacy

FOR USE IN THE

New York state hospitals

	PAGE	Literature (<i>continued</i>)	PAGE
Note.....	3	Fiction	12
State commission in lunacy.....	4	Travel	16
Reference books.....	5	General	16
Religion	6	Europe	16
Social science, customs, legends.....	6	Asia and Africa	18
Natural science.....	7	North America.....	19
Botany and zoology.....	8	South America and Oceanica....	20
Useful arts.....	8	Biography	21
Hygiene, domestic animals, sailor		Collective biography.....	21
life	8	Individual biography.....	21
Art, music, sports	9	History	23
Literature	9	History of America.....	24
Collections of poetry.....	9	Periodicals	26
Individual poets.....	9	Monthly	26
Essays, miscellany.....	10	Fortnightly	26
Humor: collections.....	11	Weekly	26
Individual authors.....	11		

NOTE .

In the following list books are arranged by classes. Except in fiction and individual biography the numbers of the *Abridged decimal classification* are prefixed with book numbers taken from the revised Cutter tables. In fiction the book numbers stand alone and in individual biography they follow the letter 'B' which indicates the class.

The name of the publisher and the price follow the title of each book.

Periodicals and reference books are in separate lists.

This book list may be used as a catalogue by making a distinct mark opposite the name of each book contained in a given library.

Additional copies of the list may be obtained from the **Public libraries division, University of the State of New York, Albany, N. Y.**

MELVIL DEWEY

Secretary of the University

Albany, March 1, 1897

STATE COMMISSION IN LUNACY

Commissioners

PETER M. WISE, M. D. <i>President</i>	-	-	-	-	-	-	-	-	Albany
GOODWIN BROWN	-	-	-	-	-	-	-	-	Albany
HENRY A. REEVES	-	-	-	-	-	-	-	-	Greenport

Secretary

T. E. MCGARR	-	-	-	-	-	-	-	-	Albany
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State hospitals

Superintendents

Utica	-	-	-	-	-	-	-	-	G. ALDER BLUMER, M. D.
Willard	-	-	-	-	-	-	-	-	W. A. MACY, M. D.
Hudson River, Poughkeepsie	-	-	-	-	-	-	-	-	CHARLES W. PILGRIM, M. D.
Middletown homeopathic	-	-	-	-	-	-	-	-	SELDEN H. TALCOTT, M. D.
Buffalo	-	-	-	-	-	-	-	-	ARTHUR W. HURD, M. D.
Binghamton	-	-	-	-	-	-	-	-	CHARLES G. WAGNER, M. D.
St Lawrence, Ogdensburg	-	-	-	-	-	-	-	-	WILLIAM MABON, M. D.
Rochester	-	-	-	-	-	-	-	-	E. H. HOWARD, M. D.
Long Island, Brooklyn	-	-	-	-	-	-	-	-	W. E. SYLVESTER, M. D.
King's Park branch	-	-	-	-	-	-	-	-	OLIVER M. DEWING, M. D.
Manhattan, New York	-	-	-	-	-	-	-	-	A. E. MACDONALD, M. D.

Ward's Island division

Female department - - E. C. DENT, M. D.

Male department - - - PERCY BRYANT, M. D.

Hart's Island division - - H. C. EVARTS, M. D.

Central Islip farm for the insane - - GEORGE A. SMITH, M. D.

Extension Bulletin

No. 18 March 1897

PUBLIC LIBRARIES NO. 5

A LIBRARY OF 500 BOOKS AND 35 PERIODICALS

SELECTED IN 1897 FOR THE

State Commission in Lunacy

FOR USE IN THE

New York state hospitals

REFERENCE BOOKS

- 031 Johnson's universal cyclopedia. 8 v. 1894-95. Appleton
qJ \$48 net.
- 423 Century dictionary and cyclopedia. 10 v. Century cloth
qC \$80; *half morocco* \$120.
Includes Century dictionary, v. 1-8; Century cyclopedia of names
and General atlas of the world, v. 8-10.
- 423 Standard dictionary of the English language. Funk & Wag-
qS nalls. 1 v. \$15; 2 v. \$18.
- 423 Webster's international dictionary of the English language.
qW Merriam \$10.62.
- 433 Thieme-Preusser German dictionary. Haendcke & Lehm-
T4 kuhl. \$4.25.
- 443 Smith, Hamilton & Legros' International English and
qS French dictionary. 2 v. Fouraut \$6.50.
- 473 Harper's Latin dictionary. Harper. \$6.50.
qH
- 803 Brewer, E. C. Dictionary of phrase and fable. Lippincott
B8 \$3.50.
- 808 Bartlett, John. Familiar quotations. Little \$3.
B2

- 903 **Harper's book of facts**; compiled by J. H. Willsey and C. T.
9H Lewis. Harper \$8.
or
- 903 **Haydn's dictionary of dates.** Ed. 21, containing the his-
H4 tory of the world to the autumn of 1895; by Benjamin Vin-
cent. Putnam \$6.
- These books, about the same size, are both revisions of earlier editions of Haydn. Many entries are identical. Harper's book of facts has more and much fuller entries on American affairs; Haydn treats foreign interests more fully and is brought more nearly to date.
- 910 **Lippincott's gazetteer of the world.** Lippincott \$8 *net*.
qL
- 910 **Rand, McNally & Co.** Indexed atlas of the world. 2 v. \$18.
fR
- 913 **Harper's dictionary of classical literature and antiquities.**
qH Harper \$6.
- 920 **Lippincott's pronouncing biographical dictionary.** Lip-
qL pincott \$8 *net*.

RELIGION

- 242 **Thomas à Kempis.** Imitation of Christ. Appleton \$1.
T4
- 245 **Keble, John.** Christian year. McClurg \$1.50.
K2
- 252 **Brooks, Phillips.** Light of the world. Dutton \$1.75.
B8
- 252 **Robertson, F. W.** Sermons. Harper \$2.
R6
- 263 **Earle, Mrs A. M.** Sabbath in Puritan New England. Scrib-
E1 ner \$1.25.
- 265 **Watson, John.** Upper room. Dodd 50c.
W3
- 266 **Gordon, M. L.** American missionary in Japan. Houghton
G6 \$1.25.
- 292 **Guerber, H. A.** Myths of Greece and Rome. Amer. book
G9 co. \$1.50.

SOCIAL SCIENCE, CUSTOMS, LEGENDS

- 328 **Alton, Edmund, pseud.** Among the law-makers. Scribner \$2.50.
A4
- 329 **Brooks, Noah.** Short studies in party politics. Scribner \$1.25.
B8
- 342 **Brooks, E. S.** Century book for young Americans. Century
B8 \$1.50.
- 342 **Brooks, Noah.** How the republic is governed. Scribner 75c.
B87

- 342 **Bryce, James.** American commonwealth. 2 v. Macmillan \$4.
B9
- 342 **Fiske, John.** Civil government in the U. S. Houghton \$1.
F5
- 342 **Porritt, Edward.** Englishman at home. Crowell \$1.75.
P8
- 374 **Chester, Eliza, pseud.** Girls and women. Houghton 75c.
C5
- 374 **Hamerton, P. G.** Intellectual life. Roberts \$2.
H2
- 391 **Steele, F. M. & Adams, E. . L.** Beauty of form and grace
S8 of vesture. Dodd \$1.75.
- 398 **Guerber, H. A.** Legends of the Rhine. Barnes \$2.
G9

NATURAL SCIENCE

- 504 **Buckley, A. B.** Fairy land of science. Appleton \$1.50.
B9
- 523 **Ball, Sir R. S.** Starland. Ginn \$1.
B1
- 523 ——— Story of the sun. Appleton \$5.
B18
- 523 **Lowell, Percival.** Mars. Houghton \$2.50.
L9
- 523 **Proctor, R: A.** Other worlds than ours. Appleton \$1.75.
P9
- 530 **Meadowcroft, W: H.** A B C of X rays. Amer. technical
M4 book co. 75c.
- 537 **Brackett, C. F: and others.** Electricity in daily life. Scribner \$3.
B7
- 537 **Meadowcroft, W: H.** A B C of electricity. Amer. technical
M4 book co. 50c.
- 549 **Ruskin, John.** Ethics of the dust. Merrill \$1.50.
R9
- 551 **Bonney, T: G:** Story of our planet. Cassell \$5.
B7
- 551 **Herrick, S. B.** Earth in past ages. Harper 60c.
H5
- 551 **Shaler, N. S.** Aspects of the earth. Scribner \$2.50.
S5
- 551 ——— Sea and land. Scribner \$2.50.
S58
- 570 **Morley, M. W.** Song of life. McClurg \$1.25.
M8
- 575 **Drummond, Henry.** Ascent of man. Pott \$2.
D7

Botany and zoology

- 580 **Dana, Mrs W. S.** How to know the wild flowers. Scribner
D1 \$1.75.
- 580 **Gray, Asa.** Lessons and manual of botany. Amer. book co.
G7 \$2.16.
- 580 **Hardinge, E. M.** With the wild flowers. Baker \$1.
H2
- 581 **Mathews, F. S.** Familiar trees and their leaves. Appleton
M4 \$1.75.
- 581 **Weed, C. M.** Ten New England blossoms and their insect
W3 visitors. Houghton \$1.25.
- 595 **Ballard, Mrs J. P.** Among the moths and butterflies.
B1 Putnam \$1.50.
- 595 **Scudder, S. H.** Frail children of the air. Houghton \$1.50.
S4
- 598 **Miller, Olive Thorne, *pseud.*** Bird ways. Houghton, \$1.25.
M6
- 598 **Parkhurst, H. E.** Birds' calendar. Scribner \$1.50.
P2
- 599 **Miller, Olive Thorne, *pseud.*** Four handed folk. Houghton
M6 \$1.25.

USEFUL ARTS

Hygiene, domestic animals, sailor life, etc.

- 606 **Jenks, Tudor, *pseud.*** Century World's fair book. Century
J5 \$1.50.
- 613.7 **Blaikie, William.** How to get strong and how to stay so.
B6 Harper \$1.
- 620 **Harcourt, L. F. Vernon—**Achievements in engineering.
H2 Scribner \$1.75.
- 636 **Miller, Olive Thorne, *pseud.*** Our home pets. Harper \$1.25.
M6
- 636 **Shaler, N. S.** Domesticated animals. Scribner \$2.50.
S3
- 636 **Strachey, J. S.** Dog stories. Macmillan \$1.75.
S8
- 640 **Parloa, Maria.** Young housekeeper. Estes \$1.
P2
- 654 **Field, H. M.** Story of the Atlantic telegraph. Scribner \$1.50.
F4
- 656 **Brooks, E. S.** Story of the American sailor. Lothrop \$2.25.
B8
- 656 **Kelley, J. D. J.** The ship's company. Harper \$2.50.
K2

ART, MUSIC, SPORTS

- 704 **Hamerton, P. G.** Thoughts about art. Roberts \$2.
H2
- 710 **Robbins, M. C.** Rescue of an old place. Houghton \$1.25.
R6
- 710 **Van Rensselaer, Mrs Schuyler.** Art out of doors. Scribner
V2, \$1.50.
- 728 **Gardner, E. C.** House that Jill built. Adams \$1.
G2
- 740 **Wheeler, Mrs Candace, ed.** Household art. Harper \$1 (Dis-
W5 taff ser.)
- 755 **Farrar, F. W.** Life of Christ as represented in art. Mac-
F2 millan \$6.
- 755 **Van Dyke, H. J.** Christ child in art. Harper \$4.
V2
- 757 **Hurll, E. M.** Child-life in art. Knight \$2.
H9
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B6 came famous. Crowell \$1.50.
- 920 **Clafin, Mrs M.. B. (Davenport).** Under the old elms.
C5 Crowell \$1.
- 920 **Human documents; portraits and biographies of emi-**
H9 **nent men.** McClure \$1.
- 920 **Yonge, C. M..** Book of golden deeds. Macmillan 50c
Y5 (Macmillan's school lib.)
- 920.7 **Bolton, Mrs Sarah (Knowles).** Lives of girls who became
B6 famous. Crowell \$1.50.
- 923 — Famous American statesmen. Crowell \$1.50.
B6
- 923 — Famous English statesmen of Queen Victoria's reign.
B6f Crowell \$1.50.
- 923 **Thackeray, W: M.** Four Georges; English humorists, etc.
T3 Houghton \$1.50 (Illus. library ed.)
- 923 **Willard, J. A.** Half a century with judges and lawyers.
W6 Houghton \$1.25.
- 926 **Parton, James.** Captains of industry. 2 v. Houghton \$2.50.
P2
- 928 **Fields, Mrs Annie.** Authors and friends. Houghton \$1.50.
F4
- 928 **Fields, J. T.** Yesterdays with authors. Houghton \$2.
F46

Individual biography

- B **Anderson, Mary.** A few memories. Harper \$2.50.
A54
- B **Barrie. Barrie, J. M.** Margaret Ogilvy. Scribner \$1.25.
B27
- B **Booth. Grossman, Mrs Edwina (Booth).** Edwin Booth.
B72 Century \$3.
- B **Bowne, Mrs Eliza (Southgate).** Girl's life 80 years ago.
B78 Scribner \$3.
- B **Caesar. Froude, J. A.** Caesar. Scribner \$1.50.
C12
- B **Curtis. Cary, Edward.** George William Curtis. Houghton.
C97 \$1.25.
- B **Dickens, Charles.** Collection of letters, 1833-70. Scribner.
D54 \$1.25.
- B **Emerson. Holmes, O. W.** Ralph Waldo Emerson. Hough-
E53 ton \$1.25.

- B **Franklin, Benjamin.** Autobiography. Houghton 50c. *net*
F83 (Riverside school lib.)
- B **Gladstone. Lucy, H. W.** The right honorable W. E. Glad-
G54 stone. Roberts \$1.25.
- B **Grant, U. S.** Personal memoirs. 2 v. Century \$5.00.
G76
- B **Hale, E : E.** A New England boyhood. Cassell \$1.
H16
- B **Holland. Plunkett, Mrs H. M. (Hodge.)** Josiah Gilbert
H73 Holland. Scribner \$1.50.
- B **Holmes. Morse, J. T.** Oliver Wendell Holmes. Houghton
H75 \$4.
- B **Howells, W : D.** My year in a log cabin. Harper 50c.
H85
- B **Irving. Warner, C : D.** Washington Irving. Houghton
I72 \$1.25 (Amer. men of letters)
- B **Jefferson, Joseph.** Autobiography. Century \$4.
J45
- B **Joan of Arc. Lowell, F. C.** Joan of Arc. Houghton \$2.
J62
- B **Johnson. Griffis, W : E.** Sir William Johnson and the Six
J71 nations. Dodd 75c.
- B **Larcom, Lucy.** A new England girlhood. Houghton 75c.
L31 (Riverside lib. for young people)
- B **Leland, C : G.** Memoirs. Appleton \$2.
L53
- B **Lincoln. Brooks, Noah.** Washington in Lincoln's time.
L73 Century \$1.25.
- B — **Coffin, C : C.** Abraham Lincoln. Harper \$3.
L73c
- B — **Schurz, Carl.** Abraham Lincoln. Houghton \$1.
L73s
- B — **Tarbell, I. M.** Early life of Abraham Lincoln. Mc-
L73t Clure \$1.
- B **Livingstone. Hughes, Thomas.** David Livingstone. Mac-
L78 millan 75c. (English men of action)
- B **Lowell, J. R.** Letters. Harper \$8.
L91
- B **Richards, Mrs L. E. (Howe).** When I was your age. Estes
R51 \$1.25.
- B **Richelieu. Lodge, Richard.** Richelieu. Macmillan 75c. -
R52
- B **Ritchie, Mrs A. I. (Thackeray).** Chapters from some un-
R59 written memoirs. Harper \$2.
- B **Shakspeare. Ward, H : S. & Ward, Mrs C. W. (Barnes.)**
S32 Shakespeare's town and times. Truslove \$3.

- B Thaxter, *Mrs Celia*. Letters. Houghton \$1.50.
 T36
 B *Victoria. Fawcett, Mrs Millicent (Garrett)*. Life of her
 V64 majesty Queen Victoria. Roberts \$1.25.
 B *Washington. Wilson, Woodrow*. George Washington.
 W31 Harper \$3.
 B *Whittier. Picard, S: T*. Life and letters of John Greenleaf
 W62 Whittier. Houghton \$4.

HISTORY

- 909 Mackenzie, Robert. The 19th century. Nelson \$1.
 M1
 933 Hosmer, J. K. Story of the Jews. Putnam \$1.50 (Story of
 H8 the nations)
 937 Merivale, Charles. General history of Rome. Longmans \$2.
 M5
 940 Coffin, C: C. Story of liberty. Harper \$3.
 C6
 940 Duruy, Victor. History of the middle ages. Holt \$1.60.
 D9
 941.5 Lawless, Emily. Story of Ireland. Putnam \$1.50 (Story
 L4 of the nations)
 942 Green, J: R. Short history of the English people. Harper
 G7 \$1.20.
 942 Latimer, *Mrs M.. E.. (Wormeley)*. England in the 19th
 L3 century. McClurg \$2.50.
 942 McCarthy, Justin. History of our own times. Lovell \$1.50.
 M1
 942 Morris, Charles. Historical tales, English. Lippincott \$1.25.
 M8
 942.1 Besant, *Sir Walter*. London. Harper \$3.
 B5
 943 Malleon, G: B. Refounding of the German empire. Scrib-
 M2 ner \$1.75.
 943 Morris, Charles. Historical tales, German. Lippincott
 M8 \$1.25.
 944 Bicknell, A.. L. Life in the Tuileries under the second em-
 B5 pire. Century \$2.25.
 944 Latimer, *Mrs M.. E.. (Wormeley)*. France in the 19th cen-
 L3 tury. McClurg \$2.50.
 944 Morris, Charles. Historical tales, French. Lippincott \$1.25.
 M8

- 945 **Clement, Mrs Clara (Erskine).** Naples, the city of Parthe-
C6 nope, and its environs. Estes \$3.
- 946 **Irving, Washington.** Conquest of Granada. Putnam \$1.50
I7 (Hudson ed.)
- 947 **Latimer, Mrs M.. E.. (Wormeley).** Russia and Turkey in
L3 the 19th century. McClurg \$2.50.
- 948.1 **Boyesen, H. H.** Story of Norway. Putnam \$1.50 (Story of
B7 the nations)
- 949.1 **Griffis, W: E.** Brave little Holland and what she has taught
G8 us. Houghton 75c. (Riverside lib. for young people)
- 949.2 **Motley, J: L.** Rise of the Dutch republic. 3 v. Harper
M9 \$6.
- 949.5 **Harrison, J. A.** Story of Greece. Putnam \$1.50 (Story of
H3 the nations)
- 960 **Latimer, Mrs M.. E.. (Wormeley).** Europe in Africa in the
L3 19th century. McClurg \$2.50.

History of America

- 970.1 **Bourke, J: G.** On the border with Crook. Scribner \$3.50.
B7
- 970.1 **Grinnell, G: B.** Story of the Indian. Appleton \$1.50
G8 (Story of the West)
- 971 **Bourinot, J: G:** Story of Canada. Putnam \$1.50 (Story of
B7 the nations)
- 971 **Parkman, Francis.** Old régime in Canada. Little \$1.50
P2 (Popular ed.)
- 972 **Prescott, W: H.** Conquest of Mexico. 3v. Lippincott
P9 \$1.50 (Universal ed.)
- 973 **Coffin, C: C.** Building of the nation. Harper \$3.
C6
- 973 **Eggleston, Edward.** Household history of the U. S. and its
E2 people. Appleton \$2.50.
- 973 **Lodge, H. C. & Roosevelt, Theodore.** Hero tales from
L8 American history. Century \$1.50.
- 973 **Morris, Charles.** Historical tales, American. Lippincott
M8 \$1.25.
- 973.1 **Fiske, John.** Discovery of America. 2 v. Houghton \$4.
F5
- 973.1 **Parkman, Francis.** Pioneers of France in the new world.
P2 Little \$1.50 (Popular ed.)
- 973.2 **Coffin, C: C.** Old times in the colonies. Harper \$3.
C6

- 973.2 **Eggleston, Edward.** Beginners of a nation. Appleton \$1.50.
E2
- 973.2 **Parkman, Francis.** Conspiracy
P2 of Pontiac. 2v.
P2h — Half century of conflict. 2v.
P2j — Jesuits in North America in
the 17th century
P2l — La Salle and the discovery of
the great West
P2m — Montcalm and Wolfe. 2v. } Little \$1.50 per v.
(Popular ed.)
- 973.3 **Coffin, C. C.** Boys of '76. Harper \$3.
C6
- 973.3 **Fiske, John.** American revolution. 2v. Houghton \$4.
F5
- 973.3 — Critical period of American history. Houghton \$2.
F5c
- 973.7 **Eggleston, G. C.** A rebel's recollections. Putnam \$1.
E2
- 973.7 **Goss, W. L.** Recollections of a private. Crowell \$3.25.
G6
- 973.7 **Johnson, Rossiter.** Story of a great conflict. Byran, Taylor
J6 \$2.75
- 973.7 **Kieffer, H. M.** Recollections of a drummer boy. Houghton
K4 \$1.50.
- 974.7 **Roberts, E. H.** New York. 2v. Houghton \$2.50 (Amer.
R6 commonwealths)
- 974.7 **Roosevelt, Theodore.** New York. Longmans \$1.25 (His-
R7 toric towns)
- 975.5 **Cooke, J. E.** Stories of the Old Dominion. Harper \$1.50.
C7
- 976.3 **King, G. E.** New Orleans. Macmillan \$2.50.
K5
- 978 **Drake, S. A.** Making of the great West. Scribner \$1.50.
D7

PERIODICALS

Monthly

Appleton's popular science monthly.	Harper's magazine.	\$4.
\$5.	McClure's magazine.	\$1.
Art interchange.	Munsey's magazine.	\$1.
Atlantic monthly.	New England magazine.	\$3.
Bookman.	North American review.	\$5.
Catholic world.	Outing.	\$3.
Century.	Review of reviews.	\$2.50.
Chautauquan.	St Nicholas.	\$3.
Cosmopolitan.	Scribner's magazine.	\$3.
Forum.		\$3.

Fortnightly

Dial.	Literary world.	\$2.
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Weekly

Critic.	Ladies home journal.	\$1.
Cultivator and Country gentleman.	Life.	\$5.
\$3.	Littell's living age.	\$6.
Frank Leslie's.	Nation.	\$3.
Harper's bazaar.	Outlook.	\$3.
Harper's round table.	Public opinion.	\$2.50.
Harper's weekly.	Scientific American.	\$3.
Illustrated London news.	Youth's companion.	\$1.75.
\$6.		

Extension Bulletin

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Report of summer school division, 1896

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Extension Bulletin

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REPORT OF SUMMER SCHOOL DIVISION, 1896

To the regents of the University of the State of New York

I have the honor to report as follows for the year ending September 30, 1896.

The custom of spending part of the summer in attendance on special courses of instruction is growing among students and others of literary tastes. The increasing number of summer schools evidences the yearly greater demand for them.

Summer schools are not only more numerous, but they are offering far greater advantages for students than ever before. While a few years ago, only a small number of summer schools could be found which offered opportunities for real study, now almost every section of the country has one or more such schools at which study in certain subjects can be satisfactorily pursued.

Following the lead of Harvard, a large number of our best colleges and universities are now offering summer work, the University of Chicago recognizing its summer term as of equal importance with the other three terms of the college year. This session covering the summer quarter, follows the same general scope of study as the rest of the college course, but when the summer session is

limited to six or eight weeks, no university should permit its summer students to elect more than one, or at most two subjects each summer. By this policy, and with the aid of well equipped libraries and laboratories the work of summer students can be continued at a grade not below that which the institution would expect of its regular students. The tendency seems to be toward specializing at each summer school and so offering opportunities all over the country for real study and help in some subject each year.

The present report contains in tabulated form the reports of the sessions of 1896 of all the summer schools from which reports could be obtained. Preceding these tables, more detailed information regarding some of the more important summer schools has also been given, with a summary of such announcements of 1897 sessions as have been received. New York schools are arranged in order of founding, others are in the same order under the state or country in which they are located. When no other authority is assigned the facts are taken from official circulars and announcements.

SCHOOLS IN NEW YORK

CHAUTAUQUA

The Chautauqua schools open July 3. The session of the school of pedagogy continues four weeks; the other schools, six weeks. The collegiate department consists of the schools of English language and literature, modern languages, classical languages, mathematics and science; social sciences, psychology and pedagogy, sacred literature, music, fine arts and expression, physical education and practical arts.

The assembly department offers daily lectures and entertainments and embraces 16 clubs and classes. Over 60 lecturers have been engaged. Among the chief topics are the following:

Early German literature, Prof. J. H. Worman

Problems of German literature in the 18th century, Dr N. I. Rubinkam

History of the labor movement, Prof. Graham Taylor

Monuments of ancient Rome and Italy, Mr Percy M. Reese

The domestic institution; development and problems, Prof.

Charles R. Henderson

Some questions of municipal life, Mr Jacob A. Riis

History of popular education, Prof. Herbert B. Adams

Problems in child study, Pres. G. Stanley Hall

The child in home, Sunday-school and society, Pres. W. L. Hervey

A group of contemporary novelists, Mr Leon H. Vincent

In the footsteps of English authors, Mr Elbert G. Hubbard

Recent tendencies of American art, Mr A. T. Van Laer

Two cheap 30-day excursions will be run from New York to Chautauqua at \$10 for the round trip; one July 2 and one Aug. 2.

NATIONAL SUMMER SCHOOL

This school has been organized as a joint stock association with a capital stock of \$25,000 divided into 1,000 shares of \$25 each. The object is not to make money but that in case of losses, the burden may not fall too heavily on one person.

The number of speakers has been reduced but not the number of lectures as experience has shown that better results are gained when only one person lectures on the same subject.

One of the most interesting courses announced is that in history by Wilbur F. Gordy. Several historical pilgrimages will be made, the first to Lake George along the old military road first opened by Sir William Johnson's men in 1775; the second to the cave in Glens Falls made famous by Cooper's *Last of the Mohicans*; the third will follow in reverse order the line of march taken by Burgoyne in 1777, and the last, by trolley car, will help the student to understand the reasons for Burgoyne's failure in 1777 to cut off New England from the other states.

The school opens July 20 for three weeks. At the close there will be an excursion to Lake George, Au Sable, Montreal and Quebec. Details of the courses are given in the announcement circular which may be obtained from the manager, Sherman Williams, Glens Falls, N. Y.

SILVER LAKE

The session of 1897 will be held July 20-Aug. 19. The summer school under the auspices of Genesee Wesleyan seminary of which Dr J. P. Ashley is president offers a variety of studies in languages, practical business, art, etc. Special attention will be given this year to the department of music under direction of L. B. Dana of Warren, Ohio. B. B. Brown of Yale divinity school remains in charge of the department of physical training. The kindergarten, classes in Bible study, special instruction in temperance and missionary work are also valuable features.

C. L. S. C. round tables will be held daily for two weeks. Rev. Ward Platt, 226 Averill av., Rochester, N. Y. is the superintendent of instruction.

BIOLOGICAL LABORATORY OF BROOKLYN INSTITUTE

The eighth session of the laboratory at Cold Spring Harbor, L. I. opens July 6 and closes Aug. 28.

Instruction will be given in the following subjects: Elementary botany and cryptogamic botany by D. S. Johnson of Johns Hopkins university; elementary zoology by Prof. H. T. Fernald of State college, Pa.; invertebrate embryology and bacteriology by Prof. H. W. Conn of Wesleyan university who is the general director of the laboratory. The laboratory fee including one course of instruction is \$20, for each additional course, \$5.

NATURAL SCIENCE CAMP

The eighth season opens June 30 and closes Sept. 1. The following is the list of instructors: T. W. Fraine, taxidermy; G. W. Herrick of Harvard university, entomology; C. K. Sarle of Rochester university, geology; W. Jones, Saunders' gallery, Rochester, photography; W. J. Roach, athletics and boxing; H. B. Woolston of Yale university, swimming; D. D. Gifford, horse-back riding. The classes in the various sciences are described as walks and talks with the instructors. No text-books are used. Instruction will be given in the use of cameras of all kinds, in developing negatives and in making positives, and in outdoor portraiture.

Members of previous camps will be entitled to wear a service stripe on each arm for each camp which they have attended. The address of the director, A. L. Arey, is 229 Averill av. Rochester, N. Y. till after June 25 when he will be at the camp, Canandaigua, N. Y.

ST JOHN'S SCHOOL

St John's school at Manlius is a high grade school founded in 1869 by the bishop of central New York. It has a military department directed by an officer of the U. S. army. The school is open during the summer and furnishes an ideal summer resort for boys. All are expected to take light physical exercise, and swimming, fishing and boating parties are organized in charge of teachers. A simplified daily military routine is established. To those who wish to study every facility is offered for the best work. An excursion is planned each year and that for 1897 will be decided by vote of the school.

The charges for the three months' session are \$100; for shorter periods, \$10 per week. William Verbeck is superintendent of the school.

CATHOLIC SUMMER SCHOOL OF AMERICA

The sixth session will be held at the assembly grounds, Cliff Haven, N. Y. on Lake Champlain, July 11-Aug. 28. Courses of lectures will be given by Rev. J. F. Loughlin, Chancellor of Philadelphia, a specialist in church history; Rev. J. H. McMahon of the Cathedral, New York, on the liturgy of the church; Rev. E. A. Pace of the Catholic university, on mental development; Rev. E. T. Shanahan, of the same university, on Scholastic philosophy and Rev. F. W. Howard of Columbus, Ohio, on Social science.

Moslem vs Greek is the subject of a course by Rev. C. W. Currier of Baltimore and Philosophical questions dealing with topics in educational literature will be discussed by Rev. J. A. Doonan of Philadelphia.

Conferences on practical Sunday-school work will be directed by Rev. D. J. McMahon of New York. A reception will be given to Rev. Thomas J. Conaty, rector of the Catholic university and formerly president of the summer school. New York, Brooklyn,

Boston, Buffalo and Rochester have taken steps toward erecting cottages on the assembly grounds.

CORNELL UNIVERSITY

Cornell university extends the same facilities for work to the summer school students as to the regular university students. The session opens July 5 and closes Aug. 14. Special work may be taken under guidance of the instructors, but students are advised to take only one or two courses. The following courses are announced and will be given without regard to the number of students applying.

Greek, 2 courses

Study and teaching of Attic Greek

Teachers' course in Homer

Latin, 2 courses

German, 4 courses

Elementary course

Schiller's *Wilhelm Tell*, Heine's prose

Prose composition, conversation and syntax

Göthe

Romance languages, 6 courses

French, elementary and advanced

French conversation, elementary and advanced

Elementary Italian

Elementary Spanish .

English, 4 courses

English composition

English prose

Old English

Middle English

Elocution, reading and speaking

Economics

Principles of economics

Economic history of the U. S.

Mathematics, 13 courses

Elementary and higher algebra

Plane and solid geometry

Higher algebra

Trigonometry

Analytic geometry, 2 courses

Calculus, 4 courses

Differential equations

Astronomy

Physics, 9 courses

General physics, 2 courses

Laboratory work in general physics

Experimental physics

Advanced laboratory work in electricity and magnetism

Dynamo laboratory practice, 3 courses

Laboratory work in general physics and applied electricity

Chemistry, 7 courses

General chemistry

Qualitative analysis, 3 courses

Spectroscopic qualitative analysis

Quantitative analysis

Technical gas analysis

Botany, 3 courses

Drawing and art, 5 courses

Drawing

Painting in oils or water colors

Modeling

Perspective

History and theory

Mechanical drawing and designing, 3 courses

Experimental engineering, 2 courses

Matriculated students of the university may receive the same credit for summer courses approved by the university faculty as for the same amount and kind in the university but not more than 10 university hours in one summer session will be credited. The credit will be based on the regular examinations held at the beginning of the fall term.

Students not matriculated will receive certificates of attendance.

Summer law school. The session opens July 5, 1897 and continues six weeks. The subjects studied will be contracts, torts, crimes, corporations, real property, wills, equity and evidence. Special attention is paid to the needs of students preparing for the bar examinations. The fee for the course is \$35.

NEW YORK UNIVERSITY

New York university will hold its third summer session during the summer of 1897. Instruction is offered in mathematics, chemistry, biology, physics, psychology, history, German, French, economics, pedagogy and physical training. The courses will be given by professors and instructors of the university, in the new buildings of the undergraduate college at University heights, New York city. The equipment at University heights, including libraries, reading-rooms, laboratories, recitation halls, residence halls, and gymnasium, will be available for the work of the summer session. The session will begin July 5 and end Aug. 13, except the pedagogy courses, which will begin July 12 and end Aug. 20. The summer courses are offered for the benefit of teachers and others who are unable to attend during the regular college year. Experience shows that much can be accomplished in six weeks by students who confine their attention to one or two subjects. The lectures are given during the first five days of the week, leaving Saturdays free for those who wish to visit the various points of interest in and about the city.

The new buildings of the undergraduate college are beautifully situated at University heights, in the northern part of New York city, 12 miles from the lower end of Manhattan island. The grounds, which cover 25 acres, lie on a high ridge, overlooking the Harlem, the palisades of the Hudson, and Long Island sound. This ridge of land with its low temperature and favorable breezes renders University heights a most inviting spot for a summer school. It would be difficult to find a location better adapted for summer work. The campus is not within the limits of the city except in a legal sense. It is surrounded by large family estates whose beautiful parks, drives and walks add to the attractive scenery so characteristic of the Hudson river region. University

lights is easily and quickly reached by the New York Central railroad, from the Grand central station at 42d st. The university campus is 10 minutes' walk from Morris lights station.

Charles Butler hall and the new East hall, the residence halls of the college, will be open during the summer session. Except where two occupy the same room or where a suite of rooms is preferred, there will be a uniform price of \$3 per week, and a choice of rooms will be granted in order of application. Diagrams and prices of rooms can be obtained from the secretary. Students are advised to secure their rooms in advance. This may be done by making a deposit of \$5, which will be considered as part payment for the rooms. Students will find it to their advantage to live on the campus. Much time will be saved, and the social life centering in the residence halls will be found pleasant. Board will be furnished in one of the college buildings under the supervision of a committee of the faculty. The price will be \$4.50 per week.

By vote of the faculty of the college and the faculty of the School of pedagogy, work done in the summer session will be accepted as counting toward a degree, when it is equivalent to the work required in the corresponding courses in the University college or the School of pedagogy. Those not candidates for degrees may obtain certificates if they desire them. This year the courses in pedagogy will begin July 12 and end Aug. 20, a week later than the other courses, to give opportunity, for those who wish, to attend the meetings of the National educational association. Students attending these courses retain their rooms for the additional work at the end of the regular session without extra charge. Only graduates of colleges or of normal schools, advanced course, are eligible for enrolment in the School of pedagogy.

Tuition fee for each student will be \$25, with an additional fee of \$5 for each laboratory course. The tuition fee admits to all courses which the student may elect subject to the approval of the faculty. As a rule, students are advised to confine their courses to one subject, but they are free to attend occasional lectures of special interest in other departments.

All correspondence should be addressed to Professor Charles B. Bliss, New York university, University lights, New York city.

NEW YORK STATE LIBRARY SCHOOL

The first summer session of the New York state library school was held in July and August, 1896. The number of students was limited to 20, but two others took part of the work. Of these 22, all but one were engaged in library work, and 10 were in N. Y. libraries. At the examinations, 14 passed, four of these with honor.^a

On account of the American library association's trip to Europe this summer, and also the extra labor involved in moving the Library school from the third to the fifth floors of the capitol, the second session of the summer school will be postponed till July and August, 1898.

TEACHERS COLLEGE, NEW YORK

The attendance at the first session of the School of manual training in 1896 was so much larger than had been expected that the school will be continued, July 7-Aug. 11, with an improved course and a larger teaching staff. The number of students last year was 53, including graduates of colleges and such institutions as Drexel institute, Pratt institute and Teachers college. In addition to the regular course in manual training for elementary schools, free-hand drawing and painting, mechanical drawing, forging, wood-joinery, wood-turning, pattern making and wood-carving, there will be a course of lectures and conferences on Mondays, Wednesdays and Fridays from 11:15 to 12:15. Prof. J. F. Reigart, of Teachers college, will give five lectures on Teaching as a fine art. The following are the subjects: 1) The teacher as an artist; 2) The nature and elements of creative power; 3) Development of creative power; 4) Principles of criticism; 5) Principles applied to government and instruction.

The remainder of the course will be on subjects of particular interest to teachers of drawing and manual training. Subjects suggested by the daily lectures and work in the shops and studios will be selected for conferences.

Persons intending to become students should notify the director, Charles A. Bennett, before June 15, stating what course they intend to take.

^a Above 90%

FRENCH RECREATION CLASS FOR GIRLS

An opportunity for the daily study of French is offered by Mlle Debray-Longchamp at her summer home in the Adirondacks on the west shore of Lake Placid. College preparatory work may also be done. The expenses for the 14 weeks beginning June 21 including tuition, books, stationery, use of piano, chaperonage, board, laundry and traveling expenses from New York to Lake Placid and return is estimated from \$225 to \$300 according to studies pursued. For farther information address Mlle Debray-Longchamp, 105 W 74th st., New York.

OTHER AMERICAN SCHOOLS**GREENACRE**

The Greenacre lectures, at Eliot, Maine, four miles from Portsmouth, N. H., were organized in 1894, the object of the movement being to afford opportunity for rational rest and recreation, together with courses of lectures on vital topics which should stimulate the higher nature and enlarge the horizon of life. The lectures are supported by voluntary contributions, no specific charge being made for the work. Many of the ablest thinkers in America have participated in the programs from year to year freely giving their services for the sake of the benefits derived from the work.

The lectures will be given as usual during 1897, in a series of conferences on the following topics:

- July 1— 5, Peace and arbitration
6—11, Education in home and school
12—18, Literature and art
19—25, Evolution
26—31, Electricity and invention
Aug. 1— 7, Ideals in business life
8—14, Psychology
15—21, Sociology
22—28, Nature
29—Sept. 2. Comparative religion

MONSALVAT SCHOOL OF COMPARATIVE RELIGION

Auxiliary to the Greenacre work, a school for the comparative study of religions was inaugurated in 1896, and will be continued during the month of August, 1897, with the following corps of instructors and general subjects of study:

History and philosophy of religion and Christian origins, Dr Lewis G. Janes, M. A. (Brown university) director of the Cambridge conferences

Religion, ethics and psychology of Buddhism, Anagárika H. Dharmapála, Ceylon

Vedanta philosophy and religions of India, Swámi Sâradânananda, India

Zoroastrianism and the religion of the Parsis, Jehranghier D. Cola, Bombay

Religion of the Jains, Virchand R. Gandhi, India

Religions of China, Rev. F. Huberty James, England, 16 years missionary in China

The fees for this instruction are voluntary. Members of the school or attendants of any of these courses of lectures will be required to enroll themselves, and are expected to pay a small sum on entering. For the further compensation of the teachers, the pupils may contribute such sums as they may desire to bestow for that purpose.

For programs and full particulars, address the director, Dr Lewis G. Janes (prior to July 1) 9 Clifton place, Brooklyn, N. Y.; (during July and August) Greenacre, Eliot, Maine.

GREENACRE SCHOOL OF LITERATURE

During the month of July class lectures on literary topics will be given as follows:

Philosophy and poetry of Ralph Waldo Emerson, Charles Malloy

Religion of the poets, Rev. William Norman Guthrie

Indian dramas, the Swámi Sâradânananda

For farther information address Charles Malloy, Waltham, Mass.

GREENACRE SCHOOL OF MUSIC

Class lessons in vocal and instrumental music, harmony and voice-culture will be given under the direction of Miss Mary H. Burnham, of New York.

For farther information concerning the Greenacre work, address Miss Sarah J. Farmer, Eliot, Maine.

NORTHFIELD CONFERENCES

The opening Bible conference of the series held at Northfield, Mass. each year will meet June 25-July 4. The World's student Christian federation will hold its first convention at Northfield in connection with the American intercollegiate Y. M. C. A. conference. Among the speakers will be Pres. Patton of Princeton and Dr Henry Van Dyke of New York.

The Y. W. C. A. conference, July 9-20 is reported under the International Y. W. C. A. conferences.

The general conference for Christian workers opens July 29 and closes Aug. 16. During July and August a Y. M. C. A. encampment is open.

HARVARD SUMMER SCHOOL

The following courses will be given at the session which begins July 6 and ends Aug. 14.

English, 5 courses

Composition, 2 courses

Anglo Saxon

Chaucer

English literature of the 18th century

German, 2 courses

French, 2 courses

Latin, for teachers

Greek, for teachers

History and government, 3 courses

American history

Civil government

Opportunities in research

Education and teaching including history and principles of education; psychology for teachers; organization, management and supervision of schools.

Methods of teaching algebra and geometry to beginners

Mathematics, 4 courses

Solid geometry

Trigonometry

Plane analytic geometry

Calculus

Engineering, 2 courses

Topographical surveying

Railway engineering

Physics, 2 courses

Chemistry, 4 courses

Fundamental principles of chemistry

Qualitative analysis

Quantitative analysis

Organic chemistry

Botany

Geology, 3 courses

Elementary geology

Geologic field work, 2 courses

Geography, 2 courses

Elementary physiography

Geography of the U. S.

Physical training, 2 courses

Courses at the medical school

Courses at the dental school

The courses are intended primarily for teachers but a few of the more elementary meet the needs of beginners and may be counted toward a degree. A catalogue giving full information of all courses may be obtained from Montague Chamberlain, 16 University hall, Cambridge, Mass.

HARVARD SUMMER SCHOOL OF PHYSICAL TRAINING

The same courses will be given as last year an account of which was given in the last report. The session will begin July 6 and end Aug. 7. Students intending to take the course are recommended to take a moderate amount of systematic physical exercise and to make a study of Gray's *Anatomy*, Waller's *Human physiology* and Appleton's *School physics*.

SAUVEUR COLLEGE OF LANGUAGES AND AMHERST SUMMER SCHOOL

The 22d session will be held at Amherst college July 5-Aug. 13. Changes are noted in the departments of German and Latin, Prof. Arnold Werner-Spanhoofd and Mrs Sofie de Beyersdorff being in charge of the German and Prof. E. D. Merriman of the Latin. There will be classes for adults in French, German, Italian, Spanish, modern and ancient Greek, Latin and English literature, and two classes in French for children. There will be each day seven hours of French, six of German, three of Latin, three of Greek, two of Italian, one of Spanish and two of English literature. Classes meet daily from 8 a. m. to 1 p. m. except on Saturdays which are devoted to recreations and excursions.

In addition to regular courses, Dr Sauveur will give a course of six lectures in French; Dr Bernhardt, two courses in German, one a discussion of the American poets, novelists and humorists as viewed by German critics, the other a description of Kaulbach's six great historical frescos in the Royal museum of Berlin with stereoscopic illustrations; other lectures will be given by the directors of the various departments.

W. I. Fletcher, librarian of Amherst college, offers the same course in library economy with such changes as have been suggested by the previous years' experience. Miss Hitchcock of Smith college remains in charge of the art department.

The tuition for all the studies and lectures of the school of language is \$20 for adults and \$6 for children. In the other departments the tuition varies according to the subject.

MARTHAS VINEYARD SUMMER INSTITUTE

The work as usual consists of an elementary and a high school course in the school of methods and 19 courses are offered in the academic department.

The school opens July 12. The school of methods closes July 30. The oratory, drawing and vocal music departments close Aug. 6, the other academic departments, Aug. 13.

The school is known as one of the oldest, largest and broadest summer schools for teachers in the U. S. The attendance in 1896 was over 725 from 40 states, territories and provinces.

H. E. HOLT NORMAL INSTITUTE OF VOCAL HARMONY

The 14th session will be held in Lexington, Mass. beginning July 13 and closing with graduating exercises July 30. Nearly 100 pupils attended the session of 1896 and 17 students were graduated. Francis W. Parker says, 'What Grube has done for number, Delsarte for elocution and Ritter for geography, Prof. Holt is doing for music in our schools.'

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

During June and July the following courses will be given if a minimum number of students apply before a fixed date:

- 1 Mechanical drawing and descriptive geometry
- 2 Mathematics: analytic geometry
- 3 Architecture
 - Shades and shadows
 - Elementary design
- 4 Chemistry
 - Analytical chemistry
 - Organic analysis, reactions and preparations
 - Principles of organic chemistry
 - Water analysis and air analysis
 - Gas, oil and sugar analysis

5 Biology

General zoology

Physiology and hygiene

Bacteriology and the micro-organisms of fermentation

6 Physics

Mechanics, light and electricity

Heat

Physical measurements

Electrical testing

7 European history**8 Modern languages**

French

German

9 Mechanism**10 Shopwork**

Woodwork

Forging

Chipping and filing

Machine-tool work

SCHOOL OF APPLIED ETHICS

No session will be held this year and the future plans are not as yet announced.

CLARK UNIVERSITY

Most of the courses offered for the fifth session, July 19-31, are entirely new and it is announced that the school is now a school of psychology, physiology, anthropology and pedagogy. The work is intended specially for:

1 University students desirous of learning features of the new psychology, some of which are not now accessible anywhere else.

2 University students of pedagogy, or of other departments, who may desire a general survey of modern psychology, education, etc.

3 Professors of pedagogy, normal school principals and instructors.

4 School superintendents and principals.

5 Writers of school text-books and publishers.

The work in biological psychology, presented by Pres. G. Stanley Hall will, it is believed, open a new field in education. The course of greatest interest will be the study and teaching of nature devoted to topics of chief importance in primary and secondary education.

Special attention has been given to child study for the last three years and it is now proposed to conclude this line of work for the present by gathering up all the results thus far obtained and applying them to actual studies and methods of school and college work by subjects and by grades.

Dr Edmund C. Sanford will give a course in psychology which is a survey of the most important results of recent psychological investigation illustrated by apparatus and class experiments; and two special courses of one week each, one an illustrative course in pedagogic measurements, the other a practical course of simple experiments.

Dr C. F. Hodge will give 12 lectures on Outlines of general biology for public school grades and the high school, with laboratory work and demonstrations. This course is coordinate with those of Pres. Hall.

Dr Adolf Meyer will give 10 lectures on the Principles of neurology and Mr Colin C. Stewart, a laboratory course corresponding with and illustrating Dr Meyer's course.

Dr W. H. Burnham offers two courses in pedagogy, six lectures on the History of education and six on the Hygiene of instruction.

Dr A. F. Chamberlain announces a new course on Anthropological aspects of childhood presenting child study from the points of view of folk thought and modern anthropological science.

The evening lectures, which are free to summer school students, are as follows:

Dr G. Stanley Hall, 1) Specialization, 2) Some fundamental religious affirmations warranted by psychology and other sciences; Dr E. C. Sanford, 1) Mind and body, 2) Physiology and psychology of color; Dr C. F. Hodge, Treatment of alcohol physiology in universities and medical schools compared with its teaching in

our common schools; Dr Adolf Meyer, On mental hygiene in the light of a study of nervous and mental diseases; Dr W. H. Burnham, Training of teachers; Dr A. F. Chamberlain, 1) Divinity of childhood, 2) Attitude of primitive people towards nature.

For information address Mr Louis N. Wilson, clerk of the university, Worcester, Mass.

COTUIT SUMMER SCHOOL

The Cotuit summer school which offers a college preparatory course to students will hold its third session from July 7 to Sept. 15. New classes will be formed Aug. 11. Applications should be addressed to Prin. Charles E. Fish, Waban school, Waban, Mass. till June 25; after that to Cotuit, Mass.

UNIVERSITY EXTENSION SUMMER MEETING

The fifth summer meeting conducted by the American society will be held in Philadelphia July 6-30, 1897.

In Department A, Medieval life and thought, the courses will be in sequence with those of the last two years in Greek life and thought and Roman life and thought.

The lectures this year will cover the literature, history, philosophy, religion, education and architecture of the period in as complete a way as possible. Prof. Jewett will give a course of five lectures on Arabic history, Prof. Cheyney, five lectures on the Formation of the English constitution and Prof. D. C. Munro, three lectures on the Influence of the crusades. In the department of literature Prof. Lang will treat of Romance literature, Dr C. G. Child of Early English literature. The Constitution of the medieval church will be the subject of five lectures by Prof. Shanahan and Life in the English monasteries will be considered by Dr Fairley. Medieval philosophy and Medieval education will be considered respectively by Prof. Shanahan in 10 lectures and Prof. D. C. Munro in five lectures. English local institutions will be the subject of five lectures by Prof. Andrews of Bryn Mawr, Architecture by Mr Pilcher, and Medieval science by Prof. Magie.

Psychology, child study and kindergarten will embrace a course of 20 lectures by Prof. Lightner Witmer of the University of

Pennsylvania, on Modern problems and theories in psychology; five lectures by Prof. J. M. Baldwin, of Princeton, on Mental development; five lectures by Prof. E. B. Titchener, of Cornell, on Psychology of attention; five lectures by Mr R. P. Halleck, on the Education of the central nervous system; five lectures by Miss Laura Fisher, Boston, on the Psychological significance of the kindergarten. Laboratory courses will be given by Prof. A. F. Witmer on the Structure and function of the nervous system and the sense organs, a demonstration course in the Psychology of sensation and perception, by Prof. Lightner Witmer and Mr Albert L. Lewis, a course in Child psychology by Prof. Lightner Witmer and Mr Oliver Cornman, a course in Advanced psychology by Dr Edgar A. Singer jr and Mr Albert L. Lewis. There will be also a psychologic clinic and training school, the practice kindergarten and educational conferences.

Department C is a series of round table conferences, in which will be considered the pedagogic aspects of the various subjects brought up in the other departments. Professors Hart and Davis of Harvard, Prof. Bronson of Brown, Mr Edward Everett Hale jr and others will take part.

Departments D and E will be conducted on the plan of the regular college class, for the benefit of beginners and more advanced students in mathematics and Latin. In the Department of music, courses on harmony and counterpoint are offered by Prof. Hugh A. Clarke, of the University of Pennsylvania.—DANA C. MUNRO, *Director*

LEHIGH UNIVERSITY

A summer school of surveying will be held at Lehigh university South Bethlehem, Pa. for four weeks beginning June 21. Three courses are offered:

- 1 Land and town surveying, corresponding to the course given to civil engineering students in the second term of the sophomore year, and open to students who have completed the freshman year or to any one having a good knowledge of geometry and trigonometry.

2 Topographical surveying, corresponding to the civil engineering course in the first term of the junior year and open to all who have completed course 1 or its equivalent.

3 Geodetic surveying, corresponding to the senior course in civil engineering and open to all who have completed courses 1 and 2. Examinations are held at the close of the session and certificates are given. The fee is \$15.

PENNSYLVANIA SUMMER SCHOOL

The Pennsylvania summer school at Huntingdon, the only professional summer school for teachers in Pennsylvania, will hold its third annual session July 12-30, 1897. Huntingdon is on the banks of the Juniata river in a beautiful mountain valley noted for its historic associations. The Juniata college buildings which will accommodate 200 students with rooms and board are used by the school.

The school aims to give teachers an opportunity to review and keep in touch with recent educational advances and also to take up more advanced lines of professional work. There will be a general course in Educational philosophy by different members of the faculty and special courses in biology and microscopy, child study, drawing and painting, geography, grading and management of rural schools, history and civil government, history of education, literature, methods of teaching and school management, music, natural science, physical culture, photography, psychology, reading and elocution, supervision and high school management.

Round table conferences on pedagogic subjects will be held every afternoon when there are no lectures and there will be evening lectures and musical and literary entertainments. The tuition is \$15 and board for the term \$10. The secretary is Miss Amanda Landes, Millersville, Pa.

NATIONAL SCHOOL OF ELOCUTION AND ORATORY

The National school of elocution and oratory of Philadelphia will hold a summer session of four weeks, beginning July 8 in connection with the Pennsylvania Chautauqua at Mt Gretna, Pa.

JEWISH CHAUTAUQUA SUMMER SCHOOL AND ASSEMBLY

The Jewish Chautauqua society being the department of Jewish studies in the Chautauqua literary and scientific circle has been in existence about three years. It has created a series of reading courses in Jewish history and literature with nearly 1500 readers in all parts of the United States, Canada and British India.

The following are the courses of readings for circles and individual readers:

1 Young folks' reading union, arranged by Miss Diana Hirschler, intended for post-confirmands, or boys and girls from 15 to 18 years of age. This is a two years' course in fiction and history, in a series of interesting programs for semi-monthly meetings. Members who complete the two years' course will receive a certificate. This course leads up to the regular Chautauqua courses in Jewish history and literature. Membership fee, 25 cents per annum.

2 Bible course. In answer to an urgent and wide-spread demand, Rev. Dr Henry Berkowitz, Chancellor of the Jewish Chautauqua society, has prepared a guide for Bible reading, entitled 'The open Bible,' and arranged in accordance with the Chautauqua system of education. Part 1 covers the entire range of Bible history. Membership fee, 50 cents.

'The open Bible,' part 2 contains the books of the Bible not treated of in part 1, and the Apocrypha. (In preparation)

3 Courses in post-biblical history and literature, arranged by Prof. Richard J. H. Gottheil.

a Comprising the era from Ezra and the return of the Jews from Babylon (537 B. C. E.) to the origin of Christianity. Membership fee, 50 cents.

b On the origin of Christianity and the compilation of the Talmud. Membership fee, 50 cents.

c The Jews during the crusades and their Golden era in Spain.

4 General Chautauqua course. A four years' course of readings in history, literature, science and art of a high school or academic grade. Membership fee, 50 cents per annum.

5 Special courses of reading on a wide range of subjects arranged by men and women of acknowledged leadership in their departments.

The first summer assembly ever projected by Jews and for the presentation of Jewish thought will be established by this society at Atlantic City, N. J. Daily sessions will be held beginning July 23 and closing Aug. 8, 1897.

At the opening meeting Sunday July 25 an address will be delivered by the Chancellor, Dr Henry Berkowitz of Philadelphia. Fraternal greetings will be extended to delegates of the various national organizations for education among the Jewish people, as follows:

Council of Jewish women, Mrs Hannah Solomons, president, Chicago

Sabbath school union of America, Rabbi William Rosenau, Baltimore

Jewish publication society, Dr Charles Bernheimer, secretary, Philadelphia

Hebrew union college, Rev. Charles Levi, secretary of the faculty, Cincinnati

Theological seminary, Dr S. Morias, president, Philadelphia

National farm school, Rev. Dr Krauskopf, president, Philadelphia

Central conference of American rabbis, Dr M. H. Harris, New York

A series of popular evening lectures will be held. Among the speakers named are Dr R: J. H. Gottheil of Columbia university, New York, Hon. Simon Wolf, Washington, D. C. and Mr Leo N. Levi of Galveston, Texas

Chautauqua circles will be conducted in Bible study by the chancellor, Dr Berkowitz, based on his syllabus entitled 'The open Bible,' and by Mr George A. Kohut of New York.

Chautauqua circles in post-biblical history will be conducted by Prof. R: J. H. Gottheil of Columbia university, author of the syllabuses in that subject. His topic will be the Rise of Christianity and the origin of the Talmud. Dr M. H. Harris of New

York will lead a circle in the study of Jewish history, from the return of the Jews from Babylon to the rise of Christianity.

The first teachers institute for Jewish Sabbath school teachers will be held. Complimentary tickets are issued to all these teachers throughout the land. Dr Henry M. Leipziger of New York will be in charge. A series of practice lessons will be conducted in primary work by Miss Ella Jacobs of Philadelphia, in biblical history by Dr William Rosenau of Baltimore, in Psalms by Dr M. H. Harris of New York.

There will be a series of talks to teachers (syllabuses will be provided) on Bible ethics and how to teach the subject, by Dr K. Kohler of New York; on Jewish Sabbath school pedagogics by Dr Louis Grossman of Detroit; Principles and methods of teaching by Dr H. M. Leipziger of New York.

Lectures on the following special topics will be given:

Palestine illustrated with stereopticon views by Prof. Richard Gottheil; Family life in biblical law, Mr David W. Amram, Philadelphia; Fundamental principles in teaching, Miss Henrietta Szold, Baltimore.

Practical problems will be discussed, among these, Sabbath school organization by Dr Lee K. Frankel of Philadelphia; the Bond between the home and school by Mrs Rebekah Kohut of New York, Sabbath school libraries by Dr Charles S. Bernheimer, Philadelphia.

Divine services will be held and sermons preached by Dr Joseph Krauskopf, Philadelphia, Rev. E. N. Calisch, Richmond, Va., Stephen S. Wise, New York, I. L. Leucht, New Orleans, Joseph Silverman, New York and Rev. S. Hecht, Milwaukee.

The Young folks reading union, a preparatory course for boys and girls will hold sessions under the guidance of Miss Diana Hirschler, Philadelphia, Rabbi Charles Fleisher, Boston, and Isaac Hassler, of Philadelphia.

Social entertainments will also be held. A season ticket at one dollar admits to all sessions.

A complete prospectus is to be had by addressing Lee K. Frankel, director of the Jewish summer assembly, P. O. Box 825 Philadelphia, Pa.

UNIVERSITY OF VIRGINIA

Summer law lectures

Prof. R. C. Minor and Prof. W. M. Lile of the university faculty have conducted the summer lectures since the death of Prof. John B. Minor, the founder, in 1895. Hon. John M. Harlan, associate justice of the U. S. supreme court, delivered a course of lectures before the school in 1896 which was so favorably received that he has been persuaded to become one of the regular faculty of the summer school. The courses now offered will be of benefit to the following classes: 1) those just beginning their professional studies who expect to attend a full course of law; 2) those who propose to pursue their studies privately; 3) those desiring a review preparatory to collegiate work or as candidates for admission to the bar; 4) young practitioners who, lacking the advantage of systematic instruction, find their progress slow, painful and unsatisfactory; 5) those who wish a knowledge of law as a part of a liberal education.

Four classes are announced this year.

Class 1 mainly, though not exclusively, for advanced students, includes 36 lectures by Prof. Minor on common law pleading and practice, real estate and law of corporations.

Class 2 consists of 36 lectures by Hon. John M. Harlan, on constitutional law and federal practice.

Class 3 consists of 36 lectures by Prof. Lile on elementary law, principal and agent, husband and wife, parent and child, guardian and ward, personal property, wills.

Class 4, for Virginia students and practitioners only, includes 25 lectures by Prof. Lile on Virginia statutes.

A special course of 25 lectures, on evidence and mercantile paper is offered by James B. Green, law instructor in the university, beginning July 1.

Special attention is given throughout the course to the bibliography of law and the student is taught how to use text-books and cases in tracing principles and in preparing briefs. No credit is given in the university for summer work.

The dates are as follows: Class 1, July 1-21, Aug. 11-31; class 2, July 1-Aug. 11; class 3, July 21-Aug. 31; class 4, July 21-Aug. 20.

Summer school of physical training

The course will cover both theory and practice, theory only so far as to give the best results in the shortest period of time.

Anatomy, physiology, hygiene and organic training will be studied and an outline of future reading suggested. The practical side will be developed beyond theory.

New features of the work are the introduction of field and track athletics.

The exercise hall is the Fayerweather gymnasium with a floor space of 12,000 feet. The school opens July 1 for eight weeks. The fee for the entire course is \$40.

WAKE FOREST COLLEGE

The first summer session of this college will be held at Wake Forest, N. C. June 28-July 23. No preparation is required for entrance and the elective plan will be followed. Instruction will be given mainly by lectures and so far as time will allow will be the same as in the regular college courses. Prof. W. H. Page will give a course of lectures for teachers on the science and art of teaching and school management.

A pastors' institute will be held at the same time as the summer school. Six lectures will be given on the Book of Genesis, Bible doctrines, Preparation and delivery of sermons, Old testament history, Gospel of Matthew and Book of Romans and four lectures on Pastoral duties and Baptist history. A class in New testament Greek will be formed.

The summer school fee is \$5, and the pastors' institute entrance fee, \$3.

Summer law school

The law school will begin June 21 and continue 10 weeks. In each of the two classes, junior and senior, 50 lectures will be given.

CATHOLIC WINTER SCHOOL OF AMERICA

The Catholic winter school of America held its second session at New Orleans, La. March 4-20. The opening religious services were held in the Cathedral of St Louis Sunday, Feb. 28 when Most Rev. Archbishop Martinelli, Apostolic delegate to the U. S. celebrated pontifical mass. The school was formally opened in Tulane hall, March 4, in the presence of a large audience and many bishops and clergy. The lectures were of a high character and the second session was considered a decided success.

SOUTHERN STUDENTS CONFERENCE

The Southern students conference meets for the purpose of training the leaders of college young men's Christian associations in Bible study and methods of Christian work by students for students. The conference at Knoxville is designed specially for the students of the south and is similar to the conferences under the same auspices at Northfield, Mass., Lake Geneva, Wis. and Casadero, Cal.

The plan of work includes normal Bible classes, conferences on methods of Y. M. C. A. work, addresses on biblical subjects and for the purpose of deepening the spiritual life of the students, conferences on foreign missions. The afternoons are devoted to recreation and athletics.

Among the speakers and teachers for 1897 are Rev. C. I. Scofield, East Northfield, Mass., C. T. Studd, Cambridge university, England, Dr W. R. Lambuth, Nashville, Mr L. D. Wishard, New York, Rev. R. J. McBryde, Lexington, Va., A. C. Harte, Mobile, H. W. Luce, New York and W. H. Morriss, Baltimore.

NORTHERN INDIANA NORMAL SCHOOL

The first session was held in 1877 with an attendance of 300. At the session of 1896 the attendance reached 2000. There will be classes in the departments of mathematics, natural science, language, literature, history, pharmacy, music, vocal and instrumental, drawing and painting, phonography, typewriting, penmanship and commercial work. Special advantages are offered

in literature for the study of the origin, growth and development of American and English literature with English and American authors.

There will also be a class in Shakspeare, reading five of his best plays and a class in preparatory literature for college entrance for 1897-98 as arranged by the Association of colleges for the English classics.

There will be a teachers' training class and special attention will be given to professional work in pedagogy, psychology, child study and kindergarten.

The school opens June 8 for a term of 10 weeks. Catalogues may be obtained from the president, H. B. Brown, Valparaiso, Ind.

WHEATON COLLEGE

The fourth summer session will be held in the college buildings, Wheaton, Ill. June 28-Aug. 6, 1897. The school is intended to meet the needs of teachers and others who desire to rest by liberalizing study. As many teachers prefer other lines of study than those which occupy their attention throughout the year, the work offered is not primarily such as is done in the public schools. A single study is recommended to students and it is expected to accomplish as much in the six weeks as is ordinarily done in a 13 weeks term. Courses are offered in all the departments of the college and credit will be given in the college for summer school work. Recitations and lectures occupy one hour each. Evenings are given up to lectures, readings, musicales and social gatherings. Wheaton is 25 miles west of Chicago and Saturday excursions to Chicago and various points of interest are planned. The fee for the first course is \$5 and for each additional one \$2.50. Board for the term is \$24.

ILLINOIS STATE NORMAL UNIVERSITY

A summer institute will be held at normal for three weeks beginning July 12. Instruction will be given in all the various lines of professional work taught in the institution. The subjects are pedagogy, geography and history, biologic sciences, physical sciences,

English literature, Latin and German, English grammar, mathematics, school law, reading and physical culture and art. A practice school will be in session in the morning to illustrate the work of the various grades.

BAY VIEW SUMMER UNIVERSITY

The college and school of methods of which Miss M. Louise Jones of the Kansas state normal school is principal offers elementary and academic courses in kindergarten, primary and grammar grade work. Sloyd drawing, school music, elementary science, literature, history, civil government, mathematics, botany, physics, chemistry, French, German and Latin. Dr Arnold Tompkins, University of Illinois and Pres. Walter L. Hervey, Teachers college, will give courses in pedagogy, psychology and school management. The Bible school will be conducted by Dr F. K. Sanders, Yale university; the art school by J. H. Vanderpool, Chicago art institute; school of oratory by Prof. A. H. Merrill, Vanderbilt university; school of physical culture by Miss L. E. Phoenix, Oswego state normal, N. Y. and the conservatory of music by Mr Wilson G. Smith, Cleveland, O. Over 40 popular assembly lecturers have been engaged.

The school opens July 13 and closes Aug. 17. For descriptive circulars address J. M. Hall, Flint, Mich.

UNIVERSITY OF MICHIGAN

The courses offered by the summer school July 7-Aug. 18 are classified as preparatory courses for university work, special courses for teachers and advanced courses.

Students regularly matriculated in the university may receive credit according to the following rules: 1) No student shall receive more than six hours credit for work done during one session; 2) Not more than 12 hours credit may be secured to count toward a degree. A full course consists of 30 lessons, one hour a day, five days in the week. The fee for one course is \$15, two courses, \$25, three courses \$30.

The law school will open July 5 for an eight weeks session. The methods of instruction combine the lecture, the text-book and the

case system. An examination will be held on each subject when closed.

A course of free lectures and entertainments is given each year.

SECRETARIAL INSTITUTE AND TRAINING SCHOOL OF YOUNG MEN'S CHRISTIAN ASSOCIATIONS

Since last year the Western secretarial institute at Lake Geneva has been consolidated with the Y. M. C. A. training school in Chicago under the name Secretarial institute and training school of young men's Christian associations.

The dates for the different programs of 1897 are as follows:

June 18-27 College students conference

July 2-13 Y. W. C. A. summer school

July 14-Aug. 13 Summer school for secretaries and physical directors

Aug. 1-14 Institute program

The camp is open to members and guests from July 1 to Sept. 1.

Chancellor W. F. McDowell of the University of Denver, Prof. J. M. Coulter of Chicago university, Dr R. A. Torrey of Chicago Bible institute, John R. Mott of New York and S. M. Sayford of Boston will take part in the college conference.

WISCONSIN SUMMER SCHOOL OF LIBRARY SCIENCE

Miss Cornelia Marvin, instructor in reference work and bibliography at the Armour institute, Chicago, will conduct the summer school of library science which is held at Madison, Wis. under the auspices of the University of Wisconsin summer school. The session opens July 5 and closes Aug. 13. The instruction which is by lecture, demonstration and laboratory work will follow the treatment of a book through all processes in the library from the accession department till it has been classified, catalogued, loaned, repaired and rebound. The principles of cataloguing of the Dewey decimal classification and the Cutter expansive classifications will receive special attention.

COLUMBIAN CATHOLIC SUMMER SCHOOL

The courses of lectures announced for the third session which will be held at Madison, Wis. July 11-30 are as follows: Religion

and politics, Christian antiquities of Rome, Dante, Holy Scripture, Political economy, literature, law, Early missions after the pioneers, psychology, theosophy, and masterpieces of Christian art.

DES MOINES SUMMER SCHOOL OF METHODS

The growth of the summer school of methods since the first session in 1890 has been marked. It is permanently established and further progress is expected this year. The session opens July 5 and closes July 30.

The general outline of work is as follows:

PROFESSIONAL TRAINING

- 1 Primary and kindergarten methods
- 2 Methods in intermediate and grammar school work in all branches, including music, drawing and nature study
- 3 Lectures on school supervision, science of teaching and the art of teaching and managing
- 4 Lectures on psychology and history of education

ACADEMIC INSTRUCTION

- 1 A thorough review of all the common branches
- 2 Rhetoric, literature, civics and economics
- 3 Algebra, geometry and astronomy
- 4 Elocution and physical culture
- 5 Physical geography, physics, botany, geology
- 6 Penmanship, drawing and vocal music. An examination for state certificates is held at the close of the session

Drake University Summer Latin School

The session of nine weeks is devoted entirely to the study of Latin thus enabling students by concentration to cover the work of 36 weeks of Latin as ordinarily pursued. The school opens June 21 and closes Aug. 20. The first year class studies Collar and Daniell's *First Latin book*, 7 weeks and Caesar, book 2, two weeks; the second year class spends five weeks reading three books of Caesar and four weeks on four orations of Cicero; the third year,

class spends 7 weeks on six books of Virgil and two weeks on 2000 lines of Ovid. The writing of Latin is made prominent in the first two years and metrical reading and mythology, in the third year. The Roman method of pronunciation is taught.

A series of lectures will be given on the practical value of Latin and its importance as a means of culture and discipline. The fee for the course is \$15.

KANSAS STATE NORMAL SCHOOL

The object of this summer school is to enable teachers to secure professional training and a college education by attending a series of summer sessions. A complete record of all work done is kept.

Students are advised to take only two studies. In botany and zoology from four to five hours a week are required to be spent in the laboratories. The fee is \$10 for the first study and \$3 for each additional study. A nine weeks session is held beginning June 11, 1897.

FAIRMOUNT CHAUTAUQUA

The Fairmount Chautauqua announces its second session at Kansas City, Mo., June 1-12. More attention will be given to school work than last year and an attractive Chautauqua assembly program has been arranged with the usual conferences and round tables.

GREELEY SUMMER SCHOOL

Joseph F. Daniels, art instructor in the state normal school, Greeley, will give a course of 16 lectures on form study and drawing in public schools. The topics are: 1) Forms of expression and correlation; 2) Projections, orthographic and perspective; 3) Theory of color; 4) Use of color; 5) Light and shade; 6) Historic ornament; 7) Decorative design; 8) How to judge a picture; 9) How to decorate a school room; 10) Blackboard drawing, specially for the country school; 11) History of art; 12) Practical things; 13) Esthetics. The remaining lectures are reserved for consideration of problems arising during the course. The course ticket is \$4.

LELAND STANFORD JR UNIVERSITY

Courses open to matriculated students in the university, to teachers and others qualified for the work will be given at the university

beginning May 31. The subjects are Greek, Latin, German, French, English, history, mathematics, physics, chemistry, civil engineering, electrical engineering and music. The fees are \$15 for a six weeks course and \$20 for an eight weeks course.

Hopkins seaside laboratory. The laboratory is at Pacific Grove on Monterey bay. The sixth session will open June 7 and close July 17. Courses by instructors from the biological departments of the university will be given in elementary zoology and botany, advanced invertebrate zoology, vertebrate embryology and the physiology of marine forms. The fee including laboratory materials and supplies is \$25.

INTERNATIONAL Y. W. C. A. CONFERENCES

Four conferences are announced for the summer of 1897. The first will be held at Asheville, S. C. June 15-25 in the Normal and collegiate institute, directed by Miss Eva Seevers. Mornings are devoted to conference and Bible study, afternoons to rest and recreation and evenings to vesper services and public meetings.

The Lake Geneva conference will be held at Y. M. C. A. camp, Lake Geneva, Wis. July 2-13 with Miss Eva Seevers as leader. The Northfield conference at Northfield, Mass. will be held July 9-20 with Miss E. K. Price as leader. The fourth conference will be held at Mills College, Cal. July 13-23 with Miss Florence Simms as leader.

The registration fee is \$5 except for the Mills College conference which is \$3.

For farther information address Miss Carrie B. Wilson, 1004 Champlain bldg. 126 State st. Chicago, Ill.

FOREIGN SCHOOLS

SUMMER SCHOOL OF SCIENCE FOR THE ATLANTIC PROVINCES OF CANADA

The session of 1897 will be held at Yarmouth, N. S. on the Atlantic coast, July 7-22. Besides the science classes there are classes in civics, vocal and physical culture; English literature, the study for this year being a number of Robert Browning's poems; kindergarten principles, music (tonic sol-fa notation), and psychology.

Class instruction is given for the most part between nine and three o'clock leaving the remainder of the afternoon for field work, etc. Advanced classes in the different subjects will be formed providing students send their names and subject to the secretary not later than May 1. There is an additional fee of \$2 for advanced work.

NEFF COLLEGE OF ORATORY

The summer session of the Neff college of oratory of Philadelphia will be held in Toronto, July 5-Aug. 14 in the Young woman's Christian guild hall, 19 and 21 McGill st. Daily lectures will be given by the president, Silas S. Neff, on the fundamental principles of the new oratory and the new education, including interpretation of literature and of nature, extempore speech, conversation, authorship, etc. There will be exercises in declamation, recitation, oratory, voice culture, rhetoric, reading, dramatic culture, Bible and hymn reading, delivery of sermons and psychology.

Classes will be in session five days in the week from 9 a. m. to 12 m. The tuition for the full course is \$40. Circulars may be obtained from the president, 1414 Arch st. Philadelphia, Pa.

EDINBURGH SUMMER MEETING

The 11th summer meeting at Edinburgh will be held this year at University hall, Aug. 2-28. Courses will be given by Prof. Patrick Geddes, Prof. Charles Zeublin of Chicago, Dr John G. Robertson, Miss Glidden of Pratt institute, Brooklyn, and others. The studio of the Old Edinburgh school of art will be open to students of fine art during the meeting.

OXFORD SUMMER MEETING

The eighth summer meeting will be held at Oxford July 31-Aug. 25, 1897. The main courses of study will be the history, literature, art and economics of the revolutionary epoch, 1789-1848 and will be a continuation of those given at the previous meetings. The list of lecturers on these subjects includes among many well known names the lord bishop of Ripon, Canon Gore, Prof. R. G. Moulton, Rev. W. H. Shaw, Rev. P. H. Wicksteed, Justin McCarthy and M. E. Sadler. Lectures will be given in French on Chateaubriand, Victor Hugo, Balzac, George Sand and others and there will also be a class in French, in the original authorities for the study of the French revolution.

Science work will include daily lectures on chemistry, botany, elementary physics, anthropology, zoology and bacteriology if a sufficient number of applications for each course are received on or before July 15. The science lectures are intended to occupy the whole of each morning.

Other courses are the history and theory of education with special reference to child-study and the kindergarten method, a special class in the English language intended primarily for foreigners, history of architecture with special reference to the buildings of Oxford and its neighborhood and if there are a sufficient number of applications, classes in Greek, Latin, French language and literature.

Canon Scott Holland will deliver a course of six lectures on St John's gospel and other theological lectures and special sermons will be given. The London ethical society has arranged for six lectures on the Theory of virtue and the virtues by Prof. W. R. Soley of Aberdeen.

A course of manual training for the certificates of the city and guilds of London institute will be given specially for teachers at the Oxford city technical school. The fee for the 20 lessons is £1.

All correspondence should be addressed to J. A. R. Marriott, University extension office, Examination schools, Oxford.

LECTURES TO CLERGY

The lectures to clergy of the Church of England will be given this year at Cambridge, July 19-31.

The subjects for the first week are St Mark's gospel, History and doctrine of ordination, Christian life and thought in the sub-apostolic age, Relations between England and the papacy to the reformation; for the second week, Some points in the theology of the *Psalms*, *Epistle to the Galatians*, Types of apostolic teaching in the book of *Acts*, Growth of English nonconformity and its differentiation into dissent.

Other lectures will be given by the dean of Ely, Archdeacon Wilson, Prof. Clifford Allbutt, Rev. J. A. Kempthorne and Rev. W. H. Frere.

NATIONAL HOME READING UNION

No summer meeting will be held this year owing to the Diamond jubilee celebrations in June and July but it is hoped to arrange

conferences of special interest to Union readers in connection with the Oxford summer meeting and the Women's educational section of the Victorian era exhibition.

JENA

A general continuation course consisting of general physiology, physiologic psychology, hygiene, philosophy and pedagogy will be held in Jena Aug. 2-14.

A special course for natural science teachers of secondary schools consisting of astronomy, botany, physics and zoology will be held Aug. 2-14.

There will be an elementary and an advanced course in German language and literature for foreigners Aug. 2-21.

Other courses are the history of religion, civilization and art. The secretary is Hugo Weinmann, Spitzweidenweg 4, Jena.

ALLIANCE FRANCAISE

The vacation courses in French conducted by the Alliance française at the Ecole coloniale, Paris, will be given in two series in July and August 1897.

The courses offered are the same as last year consisting of an advanced and an elementary course in each series with 12 lessons on the institutions of France and 12 lessons on the history of French art studied from the works of art in the museums and galleries of Paris and the neighborhood.

The examination in July for the advanced diploma will be on the following works: *La Fontaine, Fables*, (first six books); Bossuet, *Sermon sur la mort*; Molière, *Tartufe*; Beaumarchais, *Le mariage de Figaro*; Hugo, *Les Burgraves*. The works for the August examination are Racine, *Andromaque*; La Bruyère, *Caractères, ch. 1: Des ouvrages de l'esprit*; Mme de Lafayette, *La princesse de Olèves*; Leconte de Lisle, *Les poèmes antiques*. The session of 1896 was most successful with an attendance of 326 students, 31 of whom received the advanced diploma and 17 the elementary diploma.

UNIVERSITY OF GENEVA

The vacation courses of modern French which were organized in Geneva in 1892 will be held in 1897 in two series, a summer

course, July 17-Aug. 30 and an autumn course Oct. 1-20. Prof. Bernard Bouvier of the faculty of letters and science is director.

The program consists of courses on contemporary French literature, analytical reading of modern French authors, improvisation and discussion, style, methods of teaching French, French syntax and idioms, elocution and pronunciation. A special course of lectures will be given during each series.

SUMMER CONFERENCES AND CONVENTIONS OF 1897

MAINE

American institute of electrical engineers. A general meeting will be held at Greenacre, Eliot, Me., beginning July 26, this date being the 50th anniversary of the electrical discoveries of the late Prof. Moses G. Farmer.

CONNECTICUT

American board for foreign missions. The 88th annual meeting will take place in New Haven, Oct. 12-15. Dr R. S. Storrs will deliver the president's address.

NEW YORK

The Home missionary society of the congregational church will meet at Saratoga, June 1-3.

The International missionary union will meet at Clifton Springs, June 9-15. Many prominent in missionary work are expected to take part in the conference.

Music teachers national association. This convention will be held in the Grand central palace, New York city, June 24-28. There will be conferences on Music in the college and university, Prof. G. C. Gow of Vassar college, chairman; Public school music, training and popular music culture, Mr Frank Damrosch, chairman; Methods and results in music schools, Mr C. H. Morse, Brooklyn, chairman; and a conference of musical journalists, Mr L. E. Elson of Boston, chairman. Handel's *Messiah* will be given by eminent soloists and a chorus of 1500 voices under the direction of Mr Frank Damrosch.

University convocation. The 35th University convocation of the State of New York will be held in the senate chamber, Albany,

Monday, Tuesday and Wednesday, June 28-30. The first session will open with the Chancellor's annual address. The second session will be devoted to the discussion of science teaching, with a paper by Prof. William Morris Davis of Harvard university on the Present trend of geography; the subject of the third session is Athletic and oratorical contests; of the fifth and sixth sessions the American university and the American college. On Tuesday evening (fourth session) Pres. James H. Canfield of Ohio state university will give an address on The state and education.

The New York summer institutes under direction of the state department of public instruction will be held at Chautauqua, Thousand Island Park and Glens Falls, July 12-30, and will be conducted respectively by Isaac H. Stout, Welland Hendrick and Percy I. Bugbee. There are two departments, the Professional training department, embracing psychology and principles of education; and the Drill and review department, which prepares for the state or the uniform examinations in all subjects except the languages. These institutes are free to residents of the state.

Brotherhood of the kingdom. The annual conference will be held at Marlboro on the Hudson, Aug. 2-7. Religion and social questions of the day will be the subjects under discussion.

Brotherhood of St Andrew of the protestant episcopal church. The first international convention will be held in Buffalo, Oct. 13-17. Delegates from all the brotherhoods in the different national churches are expected to attend and an invitation has been extended to all the Anglican bishops. There will be sermons and addresses by many noted clergymen and laymen among whom are the lord bishop of Rochester, Eng., Rev. Charles Gore, D. D., canon of Westminster, London, Very Rev. Vincent Rorison, D. D., dean of St Andrew's, Scotland and Right Rev. Henry C. Potter, D. D., bishop of New York.

National woman's Christian temperance union. The national convention will be held at Buffalo, Oct. 29-Nov. 3, thus permitting many of the delegates to the World's W. C. T. U. convention at Toronto, closing Oct. 26, to be present. Lady Henry Somerset will deliver the annual sermon.

PENNSYLVANIA

The American library association will meet in Philadelphia, June 21-25. For two of the sessions a double program has been arranged, one for those specially interested in college and advanced library work, the other for less experienced librarians, treating of elementary library practice.

Those who are to attend the international conference in London, arranged by the Library association of the united kingdom, will leave Philadelphia June 25 and those taking the American post-conference trip to Delaware Water Gap and vicinity, June 26.

TENNESSEE

Tennessee centennial. The exposition which commemorates the centennial of the state of Tennessee will be opened at Nashville May 1 and close Oct. 1. Nashville has contributed a half million dollars toward the general expenses and most of the states have made liberal appropriations for exhibitions. A special educational building for the exhibit of school work of all grades has been erected, but so much space has been called for that it has been found necessary to put some of the exhibits in the Commerce building. The Nashville schools will make the most elaborate display. Vanderbilt university, Peabody normal college, the University of Tennessee and many other colleges and private schools have arranged exhibits. The offering of medals and diplomas has aroused considerable emulation.

The International convention of the Baptist young people's union of America will be held in Chattanooga, July 15-18.

OHIO

The American bar association meeting will be held in Cleveland, O. Aug. 25-27. Hon. James M. Woolworth of Omaha, Neb. will present a summary of the important legislation of the year.

MICHIGAN

Scotch-Irish conference. The ninth annual conference of the Scotch-Irish in America will be held in Detroit, June 10-13. Many prominent speakers will deliver addresses.

National Y. P. C. U. of the universalist church will hold its annual convention in Detroit, July 6-13. This organization is simi-

lar to the Epworth league of the methodist church and numbers 450 local societies.

The American institute of architects will meet in Detroit, Sept. 28-30.

WISCONSIN

The National educational association meets this year in Milwaukee, July 6-9. The president of the association is Hon. Charles R. Skinner, superintendent of public instruction of New York state. A rate of one fare for the round trip is offered by the railroads till Aug. 31. The North American child-study association which was tentatively organized at the child-study conference in Chicago, May 1, 1897, will hold its first regular meeting during the session of the N. E. A. and adopt a permanent constitution and by-laws. At the close of the general sessions there will be a conference of the new library department of the N. E. A. The following announcement of the president, Melvil Dewey, is taken from the May number of *Public libraries*.

Library department of the N. E. A.—The greatest gathering of educational workers in the world will be in session in Milwaukee July 9-13. It is the first year of the newly established library department, and it is specially important that those interested should make a strong effort for a successful library meeting. Discussions are not to deal with cataloguing, classification, and other details of library economy, but with those matters in which teachers and educational administrators of the country are most directly concerned. The field is not merely that of the pedagogic or of the general school library, but covers the whole question of reading as a factor in education, both for the young in school and for adults throughout life. Librarians will probably not attend this meeting in such numbers as they do their own national conventions, but it would be a strange neglect of the finest opportunity yet offered for needed cooperation if the representative workers in American libraries were not at Milwaukee ready to do all in their power to help the great body of teachers to increase and put to practical use their new interest in libraries and reading.

I append a list of topics which have been proposed for discussion, with the request that any one interested will suggest other topics, or name speakers who can put into a few minutes a great deal of inspiration or information of practical value. There will be little room for long papers, but we hope for many pithy, helpful little speeches.

Suggested topics: Teachers' and pupils' reading; the proper function of the national and state libraries as part of the American educational system; what they might do to assist the schools and

libraries throughout the country; state lending libraries for teachers; help to the evolution of book borrowing into book owning; the function of the schools in training readers for the public library; history of the public library movement; state aid to libraries; the classroom a preparation for popular education through libraries; education outside the classroom; the influence of the teacher in determining the reading of the next generation; is it the duty of a community to provide books for public use? how to make sure of good books in our libraries; book receptions; home libraries.

A definite program will be announced before the meeting, and the active cooperation of all interested is cordially invited.

MINNESOTA.

The American missionary association, an organization of the congregational church, will meet in Minneapolis, Oct. 19-21.

CALIFORNIA.

The Christian endeavor convention will meet this year in San Francisco, July 7-12. Open meetings will be held in six of the largest churches and one meeting each in Oakland and Alameda.

CANADA

The International conference of charities and corrections will hold an important conference at Toronto, July 7-14.

Epworth league. The third conference of the Epworth league will be held in Toronto, July 15-18.

The British association for the advancement of science will meet in Toronto, Aug. 18. Sir John Evans treasurer of the Royal society of London will preside. It is expected that the most eminent British, American and European scientists will be present at this meeting. The 10 sections of the society are mathematics and physics, chemistry, geology, zoology, geography, economics and statistics, mechanical science, anthropology, physiology and botany.

Woman's Christian temperance union. The World's convention of the W. C. T. U. will be held at Toronto, Oct. 23-26. Miss Willard will preside and there will be reports from the superintendents of the various lines of work and evening mass meeting.

The American institute of instruction of which Albert E. Winship of the *Journal of education* is president will meet in Montreal, July 9-12.

RUSSIA

The International geological congress will meet in St. Petersburg, Aug. 17 (29) for a five days session. The difference between the Russian calendar and our own should be remembered.

This brief summary of summer meetings now offering opportunities for study or conference on topics of particular interest, will make apparent the increasing recognition on the part of busy men and women, that recreation may be advantageously combined with some kinds of mental progress. It is with the purpose of directing inquirers to the meeting which is best adapted to their needs, that this bulletin is issued.

Respectfully submitted,

MELVIL DEWEY

Director

STATISTICS 1896

Reports of 1896 sessions only are included in the following tables. Schools whose first session is in 1897 are reported in their proper places in the pages preceding.

In the column headed Subjects of study, 'Chautauqua assembly topics', means the subjects commonly taught at the various Chautauquas; e. g. physical culture, elocution, art, music, W. C. T. U. methods, Sunday-school normal subjects, kindergarten, cooking, with sometimes the addition of lectures on literature or science. Schools which give instruction in the common branches usually include courses in methods of teaching each subject. A normal course is a course specially for teachers and includes method work and subjects commonly taught at normal schools.

College preparatory topics include those taught in high schools implying that the work is with special reference to college entrance requirements.

EXPLANATION OF ABBREVIATIONS

? preceding statements means approximately

a =assembly	lit =literature
anat =anatomy	mater. med =materia medica
bact =bacteriology	math =mathematics
Bib =Bible study	mech. eng =mechanical engineering
biol =biology	mus =music
chem =chemistry	norm =normal
econ =economics	p. c =physical culture
eloc =elocution	path =pathology
Fr =French	ped =pedagogy
geod =geodesy	photog =photography
geol =geology	phys =physiology
hist =history	psych =psychology
histot =histology	s. m =Summer meeting
inst =institute	s. s =Summer school
kind =kindergarten	sci =science
lang =language	stenog =stenography
lib. econ =library economy	surv =surveying

	NAME	Place	Year founded	DATE
				Opening
1	Aberdeen normal summer school.....	Aberdeen, Miss.....		
2	Acton Park assembly.....	Acton Park, Ind.....	1882	28 JI
3	Alabama Chautauqua assembly.....	Talladega, Ala.....	1894	2 JI
4	Alma college summer school.....	Alma, Mich.....	1889	29 Je
5	Am. inst. norm. meth. East. session.....		1890	
6	Am. inst. norm. meth. Western session..		1891	
7	Amer. society univ. exten. s. m.....	Philadelphia, Pa.....	1893	6 JI
8	Art academy summer school.....	Cincinnati, O.....		
9	Asheville conf. Internat. Y. W. C. A.....	Asheville, N. C.....	1895	12 Je
10	Atlanta assembly.....	Atlanta, Ga.....	1893	
11	Atlantic prov. of Can. s. s. of science...	Parrsboro', N. S.....	1887	9 JI
12	Avalon college summer school.....	Trenton, Mo.....		
13	Baker university summer school.....	Baldwin, Kan.....	1893	
14	Bay View summer university.....	Bay View, Mich.....	1885	8 JI
15	Baylor female college s. s.....	Belton, Tex.....		
16	Beatrice Chautauqua assembly.....	Beatrice, Neb.....	1887	16 Je
17	Belle Island summer school of art.....	South Norwalk, Conn.....	1894	Je
18	Berlitz summer school of languages.....	Asbury Park, N. J.....		1 Je
19	Black Hills assembly.....	Black Hills, S. D.....	1890	
20	Bowdoin college summer courses.....	Brunswick, Me.....	1895	
21	Brooklyn inst. biological laboratory.....	Cold Spring Harbor, N. Y.....	1889	6 JI
22	Buffalo summer school of pedagogy.....	Buffalo, N. Y.....	1896	13 JI
23	Business college summer school.....	Des Moines, Ia.....		
24	Butte summer school.....	Butte, Mont.....		
25	Caen holiday course for teachers.....	Caen, France.....	1894	
26	California univ. physical laboratory.....	Berkeley, Cal.....		
27	S. s. of marine biology.....	San Pedro, Cal.....	1892	
28	Cambridge summer meeting.....	Cambridge, Eng.....	1890	30 JI
29	Carthage col. summer school.....	Carthage, Ill.....		
30	a Cascadilla summer school.....	Ithaca, N. Y.....	1891	
31	Catholic s. s. of America.....	Plattsburg, N. Y.....	1892	12 JI
32	Catholic winter school of America.....	New Orleans, La.....	1895	4 M
33	Catskill school of art.....	Napanoch, N. Y.....	1891	21 Je
34	Cayuga Lake summer school.....	Ithaca, N. Y.....	1894	20 JI
35	Central New York summer school.....	Tully Lake, N. Y.....	1892	21 JI
36	Central Tennessee college s. s.....	Nashville, Tenn.....		
37	Chautauqua col. of liberal arts.....	Chautauqua, N. Y.....	1875	11 JI
38	Chicago commons s. of social econ.....	Chicago, Ill.....	1894	27 A
39	".....	".....	"	S
40	Chicago kindergarten col. s. s. of ped..	".....	"	30 Je
41	Cincinnati summer school.....	Cincinnati, O.....	1895	
42	Clarion Chautauqua assembly.....	Strattonville, Pa.....	1889	17 Je
43	Clark university summer school.....	Worcester, Mass.....	1892	13 JI
44	Clinton classical school.....	Peekskill, N. Y.....	1895	25 Je
45	Col. of agriculture & mechanic arts s. s.....	Kingston, R. I.....		

a Discontinued

summer schools, 1896

Closing	ATTENDANTS		REPRESENTATION		Subjects of study	
	Students	Visitors	States	Countries		
15 Ag					Normal course	1
26 JI					Chautauqua assembly topics	2
10 Ag					Chautauqua assembly topics	3
					General	4
					Music, drawing, penmanship, p. c.	5
31 JI	237				Vocal music, drawing	6
					General	7
22 Je	63	15	9	4	Art	8
					Y. W. C. A. topics	9
					Chautauqua assembly topics	10
24 JI	75			Can	Sci. Eng. lit. mus. eloc. econ. kind. psych.	11
					Normal course	12
12 Ag	832		11		General	13
					General	14
					General	15
28 Je					Chautauqua assembly topics	16
0					Art	17
28 Ag					Languages	18
					Chautauqua assembly topics	19
					Chemistry, physics, biology	20
17 Ag	25				Science	21
24 JI	123		18	Can	Methods, psychology, child-study	22
					Business	23
					Normal course	24
					French language and history	25
					Physics, chemistry	26
					Biology	27
24 Ag					General	28
					College preparatory and normal course	29
					College preparatory and normal course	30
18 Ag	882		20	Can. Eng.	General	31
20 Mr					General	32
					Art	33
20 Ag					Methods, sci. lang. music, mathematics ..	34
12 Ag					General	35
					Preparatory and normal course	36
1 Ag					General	37
1 My					Social science	38
8					Social science	39
11 JI	60	40	17		Kindergarten methods	40
					General	41
1 JI					Chautauqua assembly topics	42
25 JI	1300				Pedagogy, psychology, child-study	43
3 S					College preparatory	44
					Agriculture and shop work	45

Statistics of

	Lecturers	Lectures	Recitations	EXTENSION COURSES		Buildings	FEES		
				Subjects	Lecturers		Entrance	Full course	Single course
1									
2									
3									
4						Alma college		\$ 5	
5								55	\$15
6								25	15
7	35	1237				Univ. of Pa.		15	5
8									
9	13	41				Hotel		5	
10									
11	14	140						2 50	1
12									
13						University		15	5
14	43					5.		12	6
15									
16									
17								8-15 a mo.	
18									
19									
20						College		20	10
21	6	115				6.			20
22	13	112						10	
23									
24									
25									
26									
27									
28								£1 10s	
29									
30									
31	21	78	6			5.		\$10	
32								10	1
33								15 a mo.	
34						Ithaca high school		6	
35						3.		4-5	
36									
37						13.		a	
38									
39									
40	10					Chic. kind. col.		12	
41									
42									
43						University		20	12
44								100	
45									

a Fees vary in each department

summer schools, 1896

PAGES	SECRETARY		
	Name	Address	
	J. H. Phillips, director	Aberdeen, Miss.	1
	Mrs J. D. Gatch	Lawrenceburg, Ind.	2
	Rev. S. P. West, sup't		3
	J. T. Northon	Alma, Mich.	4
	F. D. Beattys	31 E. 17th st. New York	5
	Robert Foresman	262 Wabash av. Chicago, Ill.	6
50	D. C. Munro, director	111 S. 15th st. Philadelphia, Pa.	7
	J. H. Gest	Cincinnati, O.	8
	Miss C. B. Wilson	1004 Champlain bldg, 126 State st. Chi. Ill.	9
	Rev. W. Shaw, pres		10
50-1	J. D. Seaman	Charlottetown, P. E. Island	11
	F. A. Z. Kumler, pres	Trenton, Mo.	12
	G. W. Martin	Baldwin, Kan.	13
25	J. M. Hall	Flint, Mich.	14
	C. P. Fountain	Belton, Tex.	15
	A. R. Dempster, pres		16
	J. H. Boston	203 Montague st. Brooklyn, N. Y.	17
	Berlitz & Co.	1122 Broadway, New York	18
	E. E. Clough, pres		19
	L. A. Lee	Brunswick, Mo.	20
	F. W. Hooper	502 Fulton st. Brooklyn, N. Y.	21
50	F. M. McMurtry	School of pedagogy, Buffalo, N. Y.	22
	Angus McKinnon	Des Moines, Ia.	23
	J. F. Davies, sup't	Butte, Mont.	24
	J. Richards	Gram. sch. Stoke Newington, Lon. N. Eng.	25
	E. R. Drew	Oakland, Cal.	26
	W. E. Ritter	2222 Durant av. Berkeley, Cal.	27
	R. D. Roberts	Syndicate bldgs, Cambridge, Eng.	28
	W. W. Troup	Carthage, Ill.	29
	C. V. Parsell	Ithaca, N. Y.	30
25	W. E. Mosher	Youngstown, O.	31
25	A. H. Fleming	938 Royal st. New Orleans, La.	32
	Miss H. S. Peck	100 Willow st. Brooklyn, N. Y.	33
	F. D. Boynton	Ithaca, N. Y.	34
	T. H. Armstrong	Friendship, N. Y.	35
	M. W. Dogan	Nashville, Tenn.	36
	W. A. Duncan	Syracuse, N. Y.	37
	Miss M. E. Colman	140 N. Union st. Chicago, Ill.	38
	"	"	39
	Mrs J. N. Crouse, director	10 Van Buren st. Chicago, Ill.	40
	W. C. Washburne	Cincinnati, O.	41
			42
50	L. N. Wilson	Worcester, Mass.	43
	Robert McCord	Peekskill, N. Y.	44
	J. H. Washburn	Kingston, R. I.	45

Statistics of

	NAME	Place	Year founded	DATE	
				Opening	
46	Colorado s. s. of sci. phil. and lang.	Colorado Springs, Col.	1892	.....
47	Columbia college summer schools.	Various places	1877	.....
48	Columbian catholic summer school.	Madison, Wis.	1894	.....
49	Columbian university summer school.	Washington, D. C.	1894	.....
50	Connecticut s. s. for teachers	Norwich, Conn.	1891	a.	
51	Connecticut valley assembly.	Northampton, Mass.	1887	14 J1	
52	Cook county normal summer school	Chicago, Ill.	1893	13 J1	
53	Cooper memorial college s. s.	Sterling, Kan. ....	.....	.....
54	Cornell university summer school	Ithaca, N. Y.	1892	6 J1	
55	Summer law school	"	.....	6 J1	
56	Coronado Beach summer school.	Coronada Beach, Cal.	1895	.....
57	Cotuit summer school.	Cotuit, Mass.	1895	8 J1	
58	Cours de vacances de l' alliance française.	Paris, France	1894	2 J1	
59	Cumberland univ. summer law school.	Lebanon, Tenn.	1896	.....
60	Cumberland valley assembly.	Harrisburg, Pa.	1886	21 J1	
61	Denison university summer school	Granville, O. ....	.....	.....
62	Denver normal and prep. school.	Denver, Col.	1893	14 Je	
63	De Pauw university summer school	Greencastle, Ind.	1896	.....
64	Des Moines s. s. of methods.	Des Moines, Ia.	1890	6 J1	
65	Detroit Lake interstate assembly	Detroit Lake, Minn.	1893	21 J1	
66	Devils' Lake assembly.	Devils' Lake, N. D.	1892	1 J1	
67	Dickinson college summer law school.	Carlisle, Pa. ....	.....	.....
68	Doane college summer school	Crete, Neb. ....	.....	.....
69	Drake univ. summer Latin school.	Des Moines, Ia.	1891	22 Je	
70	Earlham college summer school.	Richmond, Ind.	1893	.....
71	Eastern Maine assembly.	Northport, Me.	1893	.....
72	Eastern New Eng. Chautauqua.	Ocean Park, Me.	1881	20 J1	
73	Edinburgh summer meeting.	Edinburgh, Scotland	1887	3 Ag	
74	Emory college summer school	Oxford, Ga. ....	.....	.....
75	Epworth Park assembly.	Bethesda, O. ....	.....	5 Ag	
76	Fairmount Chautauqua.	Kansas City, Mo.	1896	30 My	
77	Florida Chautauqua	De Funiak Springs, Fla.	1886	18 bF	
78	Franklin college summer school.	Franklin, Ind. ....	.....	.....
79	Gates college summer normal.	Neligh, Neb. ....	.....	.....
80	Gearhart Park Chaut. assembly	Gearhart Park, Or. ....	.....	.....
81	Geneva univ. vacation courses	Geneva, Switzerland	1892	15 J1	
82	"	"	.....	1 O	
83	Georgia Chautauqua assembly.	Albany, Ga.	1888	.....
84	Georgia univ. s. s. of mathematics.	Athens, Ga. ....	.....	.....
85	Glenmore sch. for the culture sci.	Keene, N. Y.	1891	.....
86	Grand Rapids kindergarten train. sch.	Grand Rapids, Mich.	1892	6 J1	
87	Greenacre assembly	Eliot, Me.	1894	1 J1	
88	Greer normal college summer school.	Hoopeston, Ill. ....	.....	.....
89	Grindelwald conference	Grindelwald, Switzerland.	1892	.....
90	H. E. Holt norm. inst. of vocal har.	Tufts college, Mass.	1883	14 J1	

a No session in 1896

b 1897

summer schools, 1896

OF	ATTENDANTS		REPRESENTATION		Subjects of study	
	Closing	Students	Visitors	States	Countries	
					General	46
					Mining, geol. surv. geod. biol. mech. eng.	47
					General	48
					General	49
					General	50
24 JI					Chautauqua assembly topics	51
3 Ag	632		29		General	52
					General	53
15 Ag	190				General	54
17 Ag					Law	55
					Science, literature, normal course	56
16 S	20				College preparatory	57
31 Ag	326			17	French language, lit. institutions, art, eloc.	58
					Law	59
31 JI					Chautauqua assembly topics	60
					General	61
16 JI	239		9	Can.	General	62
						63
31 JI	177		6		General	64
30 JI					Chautauqua assembly topics	65
					Chautauqua assembly topics	66
13 JI					Law	67
					Music	68
17 JI	45		6		Latin	69
					General	70
					Chautauqua assembly topics	71
7 Ag					Chautauqua assembly topics	72
29 Ag					Social science	73
					College preparatory	74
18 Ag					Chautauqua assembly topics	75
					Chautauqua assembly topics	76
14 Je					Chautauqua assembly topics	77
17 Mr					Eng. hist. math. chem.	78
					Normal course	79
					Common branches	80
28 Ag	159				French language and literature	81
21 O	50				"	82
					Chautauqua assembly topics	83
					Mathematics	84
					Social science	85
29 Ag	56		10	Can.	Kindergarten	86
2 S	75-600				Social science	87
						88
					Christian sociology	89
31 JI	1100				Vocal harmony	90

Statistics of

	Lecturers	Lectures	Recitations	EXTENSION COURSES		Buildings	FEES		
				Subject	Lecturers		Entrance	Full course	Single course
46	\$10	\$5
47	5	.....
48
49
50
51
52	Normal school	.....	12	3
53
54	23	.....	.....	.....	.....	University	.....	25	20
55	University	.....	35	.....
56
57	5	.....	.....	.....	.....	.....	.....	15-25	.....
58	13	158	.....	.....	.....	.....	.....	150 fr.	1 fr.
59
60
61
62	15	.....	.....	.....	.....	Normal school	.....	\$10	.....
63	10	.....
64	14	.....	.....	.....	.....	.....	.....	.....	.....
65
66
67
68
69	4	.....	270	.....	.....	University	.....	15	.....
70
71
72	5	.....	2	.....
73	19	160	.....	.....	.....	4	.....	£3 3s	10s 6d
74
75
76	8	49	.....	.....	.....	Assembly building	.....	\$2	.....
77	Assembly buildings	.....	3.50	.....
78
79
80
81	30 fr.	.....
82	15 fr.	.....
83	\$2	.....
84
85
86	5	33	101	.....	.....	.....	.....	15	.....
87
88
89
90	20	.....

summer schools, 1896

FEE	SECRETARY	
Single lecture	Name	Address
\$.50	P. K. Pattison.....	Colorado Springs, Col.....
	W. H. H. Beebe.....	Columbia college, N. Y.....
.25	H. J. Desmond.....	Wisconsin bldg, Milwaukee, Wis.....
	H. L. Hodgkins, director.....	Columbian univ. Washington, D. C.....
	C. D. Hine.....	Hartford, Conn.....
	Dr W. L. Davidson.....	Cuyahoga Falls, O.....
	W. S. Jackman, manager.....	6916 Perry av. Station O, Chicago, Ill.....
	S. A. Wilson.....	Sterling, Kan.....
	D. F. Hoy.....	Ithaca, N. Y.....
	".....	".....
	Daniel Cleveland.....	San Diego, Cal.....
	C. E. Fish, principal.....	Cotuit, Mass.....
1 fr.	P. Foncin.....	45, rue de Grenelle, Paris, France.....
	A. B. Martin.....	Lebanon, Tenn.....
	A. A. Line, sup't.....	Carlisle, Pa.....
	W. A. Chamberlin.....	Granville, O.....
	Fred Dick, principal.....	Denver, Col.....
	H. A. Gobin.....	Greencastle, Ind.....
	C. W. Martindale.....	Webster City, Ia.....
	Dr S. J. Hill, pres.....	.....
	Dr Eugene May, sup't.....	.....
	Dr William Trickett, dean.....	Carlisle, Pa.....
	H. B. King.....	Crete, Neb.....
	C. O. Denny.....	1090 25th st. Des Moines, Ia.....
	J. J. Mills.....	Richmond, Ind.....
	G. D. Lindsay, pres.....	.....
\$.25	E. W. Porter.....	85 Central st. Peabody, Mass.....
	T. R. Marr.....	Outlook Tower, Univ. hall, Edinb'h, Scot.....
	W. A. Candler.....	Oxford, Ga.....
	Rev. D. C. Osborne, sup't.....	.....
	N. S. Doran.....	618 Wyandotte st. Kansas City, Mo.....
.25	T. F. McGourin.....	De Funiak Springs, Fla.....
	W. S. Stott.....	Franklin, Ind.....
	Rev. W. Griffiths.....	Neligh, Neb.....
	H. S. Lyman.....	Astoria, Or.....
	Prof. Bernard Bouvier.....	10, Bourg-de-Four, Geneva, Switzerland.....
	".....	".....
	H. M. McIntosh.....	Albany, Ga.....
	C. M. Snelling.....	Athens, Ga.....
	Thomas Davidson.....	Keene, N. Y.....
	Clara Wheeler.....	117 Barclay st. Grand Rapids, Mich.....
	Mrs S. J. Farmer.....	Eliot, Me.....
	J. E. W. Morgan.....	Hoopeston, Ill.....
	Henry Riches.....	5 Endsleigh Gardens, Lond. N. W. Eng.....
	Mrs H. E. Holt.....	Box 109, Lexington, Mass.....

Statistics of

	NAME	Place	Year founded	DATE
				Opening
91	Hackley Park assembly.....	Hackley Park, Mich.....	1891	.....
92	Harvard s. s. of physical training.....	Cambridge, Mass.....	1887	3 JI
93	Harvard university summer school.....	".....	1874	6 JI
94	Hedding assembly.....	East Epping, N. H.....	1886	27 JI
95	Hempstead institute.....	Hempstead, L. I., N. Y.....	1837	15 Je
96	".....	Littleton, N. H.....	.....	18 Je
97	Hopkins seaside laboratory.....	Pacific Grove, Cal.....	1892	15 Je
98	Hull house college extension s. s.....	Rockford, Ill.....	1891	6 JI
99	Illinois medical college summer school.....	Chicago, Ill.....	.....	.....
100	Illinois state normal univ. summer inst.....	Normal, Ill.....	.....	.....
101	Illinois university summer school.....	Urbana, Ill.....	1894	.....
102	Summer school of biology.....	Havana, Ill.....	1896	Je
103	Illinois Wesleyan univ. summer school.....	Bloomington, Ill.....	.....	.....
104	Indiana state normal school.....	Terre Haute, Ind.....	1894	29 Je
105	Indiana university summer school.....	Bloomington, Ind.....	1890	16 Je
106	Iowa Chautauqua assembly.....	Colfax, Ia.....	.....	.....
107	Iowa school of the kingdom.....	Grinnell, Ia.....	1895	^b
108	Island Park assembly.....	Rome City, Ind.....	1878	29 JI
109	Jena holiday course for teachers.....	Jena, Germany.....	1893	3 Ag
110	Johns Hopkins univ. marine zool. lab.....	Beaufort, N. C.....	1879	.....
111	Kentucky Chautauqua assembly.....	Lexington, Ky.....	1886	30 Je
112	Knox college summer school.....	Galesburg, Ill.....	1894	.....
113	L. A. U. K. summer school.....	London, Eng.....	1893	15 Je
114	Lake Forest college summer session.....	Lake Forest, Ill.....	1895	6 JI
115	Lake Geneva conf. Inter. Y. W. C. A.....	Lake Geneva, Wis.....	1891	30 Je
116	Lake Geneva students conference.....	".....	1891	.....
117	Lake George assembly.....	Lake George as'by, N. Y.....	.....	.....
118	Lake Madison Chautauqua schools.....	Madison, S. D.....	1891	30 Je
119	Lakeside summer school.....	Lakeside, O.....	1877	13 JI
120	Lancaster assembly.....	Lancaster, O.....	.....	29 JI
121	Lehigh univ. s. s. of surveying.....	South Bethlehem, Pa.....	.....	22 Je
122	Leland Stanford jr university.....	Stanford University, Cal.....	1894	1 Je
123	Lincoln normal university.....	Lincoln, Neb.....	1892	15 Je
124	Long Beach Chant. assembly and s. s.....	Long Beach, Cal.....	1884	12 JI
125	Long Beach summer parliament.....	Long Beach, L. I., N. Y.....	1894	.....
126	Long Island Chautauqua.....	Point o' Woods, L. I., N. Y.....	1894	1 JI
127	Long Pine assembly.....	Long Pine, Neb.....	1886	17 JI
128	Louisiana Chautauqua.....	Ruston, La.....	1892	1 JI
129	Maine state college summer school.....	Orono, Me.....	1895	13 JI
130	Marientfeld summer camp.....	Milford, Pa.....	1896	30 Je
131	Marine biological laboratory.....	Woods Holl, Mass.....	1888	1 Je
132	Marthas Vineyard summer institute.....	Cottage City, Mass.....	1878	13 JI
133	Mass. inst. of technology s. school.....	Boston, Mass.....	1888	.....
134	Metropolitan normal art s. s.....	New York, N. Y.....	.....	13 JI
135	Michigan agricultural college.....	Agricultural College.....	.....	.....

^a Discontinued. Succeeded by Midland Chautauqua assembly.

^b No session in 1896

^c Discontinued.

summer schools, 1896

OF	ATTENDANTS		REPRESENTATION		Subjects of study	
	Students	Visitors	States	Countries		
8 Ag	104	2,000	26		Chautauqua assembly topics	91
14 Ag	624				Physical culture	92
15 Ag					General	93
1 S	15		1		Music, art, French, Bible, cookery, kind. p.c.	94
					College prep. & business course, music	95
18 S						96
	25				Botany, zoology	97
12 Ag	100				Science, language, needlework	98
					Medicine	99
					General	100
					General	101
Ag					Biology	102
					General	103
6 Ag					General	104
14 JI					General	105
						106
						107
12 Ag					Chautauqua assembly topics	108
23 Ag	108				German lang. and hist. pedagogy, sci.	109
					Marine zoology	110
10 JI					Chautauqua assembly topics	111
					General	112
20 Je					Library economy	113
15 Ag	35				General	114
9 JI	300	14	17	4	Y. W. C. A. topics	115
					Bible	116
					Chautauqua assembly topics	117
14 JI	150	25			General	118
15 Ag	50				Chautauqua assembly topics	119
6 Ag					Chautauqua assembly topics	120
20 JI					Surveying	121
15 JI	125				General	122
6 Ag	469	1 600			General	123
10 Ag	1 120	1 3,000			Chautauqua assembly topics	124
						125
1 O	50	500			General	126
28 JI					Chautauqua assembly topics	127
8 Ag					Chautauqua assembly topics	128
30 JI	158				General	129
1 S	15		3		College preparatory	130
1 O					Zoology, botany	131
17 Ag	700		40		General	132
					General	133
10 Ag						134
					Agriculture	135

Statistics of

	Lecturers	Lectures	Recitations	EXTENSION COURSES		Buildings	FEES		
				Subjects	Lecturers		Extra: ce	Full course	Single course
91	...	...	...	...	...	Hemenway gymnasium	...	\$50	\$25
92	30	190	...	...	...	University	...	20	...
93	...	...	...	...	...	Institute	...	60	...
94	...	...	...	...	...	...	...	85	...
95	4	...	...	...	...	2	...	25	...
96	...	...	...	...	...	...	...	...	...
97	...	...	...	...	...	...	...	...	...
98	12	...	...	...	...	University	...	10	...
99	...	...	...	...	...	University	...	10	...
100	...	...	...	...	...	Normal school	10	10	10
101	...	...	...	...	...	University	...	10	5
102	...	...	...	...	...	...	...	...	...
103	...	...	...	...	...	5	...	2 50	...
104	...	...	...	...	...	5 m'rks	...	15 marks.	...
105	...	...	...	...	...	...	...	...	...
106	...	...	...	...	...	...	...	...	...
107	...	...	...	...	...	...	...	...	...
108	...	...	...	...	...	...	...	...	...
109	14	174	12	...	...	...	...	...	...
110	...	...	...	...	...	...	...	...	...
111	...	...	...	...	...	...	...	...	...
112	...	...	...	...	...	...	...	10	\$5
113	7	8	...	...	...	College	...	20	20
114	6	...	1360	...	...	Tents	...	5	...
115	12	43	...	...	...	...	...	5	...
116	...	...	...	...	...	Assembly buildings	\$3	3	1
117	...	...	...	...	...	7	...	5	3
118	6	34	56	...	...	University	...	15	...
119	5	30	30	...	...	University	...	8	15-20
120	...	...	...	...	...	University	...	...	...
121	...	...	...	...	...	Long Beach tabernacle	2 50	...	5
122	17	...	...	...	...	...	...	...	...
123	27	29	...	...	...	2	3	...	10
124	10	18	210	...	...	College	1	...	...
125	...	...	...	...	...	Timber camp	...	150	...
126	8	...	...	...	...	4	...	50	...
127	...	...	...	...	...	...	1	...	15
128	...	...	...	...	...	...	...	...	25
129	10	95	...	...	...	...	...	...	...
130	3	...	...	...	...	...	...	...	...
131	...	...	...	...	...	...	...	...	...
132	40	...	...	...	...	...	...	...	...
133	...	...	...	...	...	...	...	...	...
134	...	...	...	...	...	...	...	...	...
135	...	...	...	...	...	...	...	...	...

summer schools, 1896

FEE	SECRETARY	
	Name	Address
Single lecture		
.....	Dr H. W. Bolton, pres	91
.....	Dr D. A. Sargent	92
.....	M. Chamberlain	93
.....	O. S. Baketel, sup't	94
.....	L. S. Hinds	95
.....	"	96
.....	O. P. Jenkins	97
.....	Miss Jane Addams	98
.....	Dr H. H. Brown	99
.....	J. W. Cook, pres	100
.....	David Kinley	101
.....	S. A. Forbes	102
.....	Wilbert Ferguson	103
.....	R. G. Gillum	104
.....	S. C. Davisson	105
.....	.....	106
.....	G. D. Herron, prin	107
.....	C. S. Stroup	108
.....	Hugo Weinmann	109
.....	W. K. Brooks	110
.....	Dr W. L. Davidson, sup't	111
.....	J. H. Finley	112
.....	W. E. Doubleday	113
.....	Malcolm McNeill	114
.....	Miss C. B. Wilson	115
.....	C. C. Michener	116
.....	D. S. Sanford, pres	117
.....	H. E. Kratz	118
.....	S. R. Gill	119
.....	W. V. Dick, sup't	120
.....	T. M. Drown, pres	121
.....	O. L. Elliott	122
.....	E. P. Wilson	123
.....	G. R. Crow	124
.....	S. H. Berry	125
.....	Howard Conklin	126
.....	.....	127
.....	.....	128
.....	Mrs E. A. Balentine	129
.....	Dr C. H. Henderson	130
.....	Mrs A. P. Williams	131
.....	A. C. Boyden	132
.....	H. W. Tyler	133
.....	L. S. Thompson	134
.....	L. G. Gorton	135

Statistics of

	NAME	Place	Year founded	DATE
				Opening
136	Michigan university summer school....	Ann Arbor, Mich.	1894	29 Je
137	Summer school of law	"	"	29 Je
138	Midland Chautauqua assembly.....	Des Moines, Ia.....	1896	10 Ji
139	Mid-summer school.....	Owego, N. Y.....	1891	.....
140	Minnesota university summer school ..	Minneapolis, Minn.	1891	27 Ji
141	Mississippi Chautauqua assembly.....	Crystal Springs, Miss.....	1895	16 Ji
142	Missouri state Chautauqua.....	Sedalia, Mo.....	1887	26 Je
143	Missouri univ. s. s. of languages.....	Columbia, Mo.....	.....	8 Je
144	Summer school of science ..	"	1895	1 Je
145	Monona Lake assembly.....	Madison, Wis.....	1880	21 Ji
146	Monongahela college summer school ..	Jefferson, Pa.....	.....	.....
147	Monsalvat sch. of comparative religion	Eliot, Me.....	1896	6 Ji
148	Montana summer school.....	Helena, Mont.....	1891	.....
149	Monteagle summer schools.....	Monteagle, Tenn.....	1882	31 Je
150	Morningside college summer school....	Morningside, Sioux City, Ia	.....	.....
151	Mount Union college s. s.....	Alliance, O.....	.....	.....
152	Mountain Chautauqua assembly.....	Mountain Lake Park, Md.	1883	5 Ag
153	National home reading union.....	Chester, Eng.....	1889	27 Je
154	National Prohibition Park	Prohibition P'k, S. I., N. Y.	1891	.....
155	National summer school	Glens Falls, N. Y.....	1882	14 Ji
156	Natural science camp.....	Canandaigua, N. Y.....	1890	1 Ji
157	Naval academy preparatory school....	Annapolis, Md.....	.....	.....
158	Nebraska Chautauqua assembly.....	Crete, Neb.....	1882	3 Ji
159	Nebraska normal college s. s.....	Wayne, Neb.....	.....	.....
160	Neff college of oratory.....	Toronto, Canada.....	1893	13 Ji
161	New Eng. Chaut. Sunday-school a.....	So. Framingham, Mass.....	1879	20 Ji
162	New Hampshire coll. s. s. of biology...	Durham, N. H.....	1894	6 Ji
163	New Hampshire summer institute	Plymouth, N. H.....	1893	.....
164	New York university summer courses...	New York.....	1895	6 Ji
165	Normal school of gymnastics.....	Milwaukee, Wis.....	1895	29 Je
166	North Carolina university s. school....	Chapel Hill, N. C.....	1894	.....
167	Summer law school .....	" .....	.....	.....
168	Northeast Georgia Chaut. assembly....	Demorest, Ga.....	1893	24 Ji
169	Northern Indiana normal school.....	Valparaiso, Ind.....	1877	.....
170	Northern New Eng. Sunday-school a...	Freyeburg, Me.....	1882	28 Ji
171	Northfield conf. Internat. Y. W. C. A.	E. Northfield, Mass.....	1893	10 Ji
172	Oberlin s. s. of Christian sociology....	Oberlin, O.....	1895	.....
173	Ocean Grove assembly.....	Ocean Grove, N. J.....	1884	6 Ji
174	Ohio university summer school.....	Athens, O.....	.....	.....
175	Ohio Wesleyan university s. s.....	Delaware, O.....	.....	.....
176	Olivet summer review school.....	Olivet, Mich.....	.....	.....
177	Summer school in Latin.....	" .....	.....	.....
178	Oregon summer school.....	Eugene, Or.....	.....	.....
179	Ottawa Chautauqua assembly.....	Ottawa, Kan.....	1878	15 Je
180	Oxford lectures to clergy.....	Durham, Eng.....	.....	13 Ji

b United with National summer school

summer schools, 1896

OF	ATTENDANTS		REPRESENTATION		Subjects of study	
	Closing	Students	Visitors	States			Countries
7 Ag	231				General.....	136
21 Ag					Law.....	137
24 JI					Chautauqua assembly topics.....	138
21 Ag	1200		5		General.....	139
26 JI					Chautauqua assembly topics.....	140
4 JI					Chautauqua assembly topics.....	141
28 JI					Eng. Latin, French.....	142
11 JI					Biology, physics, chem'y, phys. phys.geog.	143
31 JI					Chautauqua assembly topics.....	144
31 JI	20-80			4	Normal course.....	145
25 Ag					Religions.....	146
					Normal course.....	147
					General.....	148
					General.....	149
25 Ag					General.....	150
6 JI					Chaut. assembly topics, stenog. photog.	151
					Science, history.....	152
3 Ag	500		28	Can	Pedagogy, common branches.....	153
26 Ag					Science, taxidermy, sketching, photog.p.c.	154
15 JI					Preparatory.....	155
20 Ag	40			Can. U. S.	Chautauqua assembly topics.....	156
1 Ag					Normal course.....	157
1 Ag					Oratory, voice culture.....	158
14 Ag	60		6		Chautauqua assembly topics.....	159
8 Ag	35		12		Botany, entomology, zoology.....	160
					General.....	161
					General.....	162
					Gymnastics, anat. phys. psych.....	163
					General.....	164
					Law.....	165
30 Ag	2,000				Chautauqua assembly topics.....	166
15 Ag					General.....	167
					Chautauqua assembly topics.....	168
20 JI	280	45	18	3	Y. W. C. A. topics.....	169
16 JI					Christian sociology.....	170
					Chautauqua assembly topics.....	171
					General.....	172
					Languages, mathematics, history.....	173
					General.....	174
					Latin.....	175
					General.....	176
26 Je					Chautauqua assembly topics.....	177
25 JI					Theology.....	178

Statistics of

	Lecturers	Lectures	Recitations	EXTENSION COURSES		Buildings	FEES		
				Subjects	Lecturers		Entrance	Full course	Single course
136	University.....	.....	\$30	\$15
137	University.....	.....	35	4-8
138
139
140	45	.....	.....	.....	.....	University.....	\$1	a 5-6	.....
141
142
143	University.....	.....	.....	10
144	University.....	b	2	.....
145
146
147	9	54	.....	.....	.....	.....	.....	.....	.....
148
149	5	.....	4
150
151
152	£1	.....
153
154
155	22	.....	.....	.....	.....	Pub. sch. & Y. M. C. A.	.....	\$20	7-14
156	64	.....
157
158
159
160	4	4	21	.....	.....	Univ. of Toronto.....	.....	40	.....
161	4.....	.....	2 50	.....
162	Thompson hall.....	.....	10	.....
163
164	10	390	360	.....	.....	University.....	.....	25	.....
165	10	.....	.....	.....	.....	Normal school.....	.....	30	15
166	17	.....	.....	.....	.....	University.....	1	5	.....
167
168	1 50	.....
169	10	.....
170	2.....	.....	2	.....
171	15	43	.....	.....	.....	Northfield sem.....	.....	5	.....
172
173	3.....	.....	.....	.....
174
175
176
177
178
179
180	£1	15s

a Free to Minnesota students
b Free to Missouri teachers

summer schools, 1896

FEES	SECRETARY		
Single lecture	Name	Address	
.....	E. H. Mensel	28 Monroe st. Ann Arbor, Mich	136
.....	E. F. Johnson	31 N. University av. Ann Arbor, Mich	137
.....	G: R. Winslow	2 Bevier st. Binghamton, N. Y	138
.....	D. L. Kiehle	Univ. of Minnesota, Minneapolis, Minn.	139
.....	Bishop C. B. Galloway .....	.....	140
.....	Miss Mary Iglehart	Columbia, Mo	141
.....	M. L. Lipscomb, prin	"	142
.....	J. E. Moseley	Madison, Wis	143
.....	Dr S. T. Wiley	Jefferson, Pa	144
.....	Miss S. J. Farmer	Eliot, Me	145
.....	R. G. Young	Helena, Mont	146
.....	J. I. D. Hinds	Lebanon, Tenn	147
.....	G. W. Corr	Sioux City, Ia	148
.....	T. P. Marsh	Alliance, O	149
.....	Dr W. L. Davidson, sup't	Cuyahoga Falls, O	150
.....	Miss M. C. Mondy	Surrey House, Vic. emb't, Lon. W. C. Eng.	151
.....	C. L. Haskell	West New Brighton, S I, N. Y	152
.....	J. A. Holden	Glens Falls N. Y	153
.....	A. L. Arey	229 Averill av. Rochester, N. Y	154
.....	R. L. Wertz	Annapolis, Md	155
.....	W. Scott, D. D., sup't .....	.....	156
.....	J. M. Pile	Wayne, Neb	157
50	S. F. Neff, pres	1414 Arch st. Philadelphia, Pa	158
.....	G: H. Clarke	Malden, Mass	159
.....	C. M. Weed	Durham, N. H	160
.....	Fred Gowing	Concord, N. H	161
.....	C: B. Bliss	University hights, New York city	162
.....	W. A. Stecher	3d and Chestnut st. St Louis, Mo	163
.....	E. A. Alderman	Chapel Hill, N. C	164
.....	John Manning	"	165
25	A. A. Stafford	Demorest, Ga	166
.....	H. B. Brown, pres	Valparaiso, Ind	167
25	N. W. Edson	First national bank, Portland, Me	168
.....	Miss C. B. Wilson	1004 Champlain b'g, 126 State st. Chic. Ill.	169
.....	Z. W. Holbrook	475 Dearborn av. Chicago, Ill	170
.....	B. B. Loomis	Canajoharie, N. Y	171
.....	Eli Dunkle	Athens, O	172
.....	J. H. Grove	Delaware, O	173
.....	C. G. Wade	Olivet, Mich	174
.....	G. N. Ellis	"	175
.....	C. H. Chapman	Eugene, Or	176
.....	Sandford Topping	Ottawa, Kan	177
.....	Rev. Dr Robertson	Bishop Hatfield's hall, Durham, Eng	178

Statistics of

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181	Pacific Grove Chaut. assembly.....	Pacific Grove, Cal.....	1878	8 J1
182	Peabody summer school.....	Troy, Ala.....	1890
183	Peabody summer normal school.....	Lake Charles, La.....	.....	.....
184	Pennsylvania Chautauqua.....	Mt Gretna Park, Pa.....	1892	8 J1
185	Pennsylvania summer school.....	Huntingdon, Pa.....	1895	14 J1
186	Petoskey normal summer school.....	Petoskey, Mich.....	.....	.....
187	Piasa Bluffs assembly.....	Alton, Ill.....	1887	23 J1
188	Port Leyden summer school.....	Port Leyden, N. Y.....	1891	.....
189	Prang summer school.....	Chicago, Ill.....	.....	.....
190	Purdue univ. sum. school of chemistry	Lafayette, Ind.....	.....	.....
191	Rock River assembly.....	Dixon, Ill.....	1888	14 J1
192	Rocky mountain Chautauqua assem'y	Glen Park, Col.....	1886	15 J1
193	Round Lake summer inst.....	Round Lake, N. Y.....	1887	21 Je
194	Eastern N. Y. s. s. for teachers	"	1894	15 J1
195	St John's school.....	Manlius, N. Y.....	1891	Je
196	Saratoga summer lectures.....	Saratoga Springs, N. Y...	1895	.....
197	Union college summer school..	"	1896	6 J1
198	Sauveur col. of lang. & Amherst s. s...	Amherst, Mass.....	1876	6 J1
199	Secretarial inst. & train. s. Y. M. C. A.	Lake Geneva, Wis.....	1884	15 J1
200	College students conference	"	1890	19 Je
201	Institute program.....	"	1884	1 Ag
202	School of applied ethics.....	Plymouth, Mass.....	1891	a
203	Shasta assembly.....	Shasta, Cal.....	1895	.....
204	Shinnecock Hills sum. school of art...	Southampton, L. I., N. Y.	1890	1 Je
205	Silver Lake assem'y and sum. univ....	Silver Lake, N. Y.....	1887	17 J1
206	Soper summer school of oratory.....	Chicago, Ill.....	.....	.....
207	Southern Oregon Chaut. assembly.....	Ashland, Or.....	1893	8 J1
208	Southern students conference.....	Knoxville, Tenn.....	1892	19 Je
209	Spirit Lake Chautauqua assembly.....	Spirit Lake, Ia.....	1893	2 J1
210	State normal summer school.....	Emporia, Kan.....	1891	.....
211	Stryker summer normal.....	Stryker, O.....	.....	.....
212	Summer review school.....	Wahpeton, N. D.....	1895	.....
213	Summer school of methods.....	Dover, Del.....	1892	.....
214	Summer school of pedagogy & review.	Beuton Harbor, Mich.....	.....	.....
215	Summer school of science.....	Kingston, Canada.....	1894	7 J1
216	Summer vacation meeting.....	Keene, N. Y.....	1894	.....
217	Table Rock assembly.....	Table Rock, Neb.....	1896	1 J1
218	Teachers college s. s. of manual training	New York.....	1896	6 J1
219	Terrell college summer school.....	Decherd, Tenn.....	.....	.....
220	Texas Chautauqua assembly.....	Georgetown, Tex.....	1888	.....
221	Throop polytechnic summer normal s..	Pasadena, Cal.....	.....	.....
222	Tri-state normal college sum. school...	Angola, Ind.....	.....	.....
223	Tuskegee summer assembly.....	Tuskegee, Ala.....	1895	.....
224	University summer normal.....	University, Miss.....	.....	.....
225	Upsala summer meeting.....	Upsala, Sweden.....	1893

a No session in 1896

summer schools, 1896

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13 Ag					General.....	194
8					Optional.....	195
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14 Ag					General.....	197
14 Ag	220		18		5 Lan. sci. Eng. lit. lib. econ. art. math. p. c.	198
15 Ag	55	200	15	Can.	Y. M. C. A. topics, physical culture.....	199
29 Je	305	25	17		Bible, missions, Y. M. C. A. topics.....	200
14 Ag	25	100	2		Bible, Y. M. C. A. topics.....	201
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	240		Kan.		General.....	210
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					General.....	212
					Normal course.....	213
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9 Ag	22		1	Can.	Science.....	215
					Nature.....	216
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8 Ag	53		10	Can.	Manual training, drawing, painting.....	218
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				Subjects	Lecturers		Entrance	Full course	Single course
181						2			
182									
183									
184									
185						Juniata college		\$15	\$5
186									
187									
188	3		180			Union school		3	
189									
190									
191									
192						4		2 50	
193						6			
194						6		9	3
195								100	
196									
197	12					High school	1		15
198	15					Amherst college		20	20
199	12	200	180			6	3		1
200									
201									
202									
203									
204								32-80	
205			160			9	5		1-10
206									
207						1	25	1 50	
208	17							6	
209									
210	11					Normal school			10
211									
212									
213									
214									
215	4				4				4-6
216									
217									
218	8					College			25
219									
220								4	
221									
222									
223									
224									
225									

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Single lecture			
.....	Mrs E. J. Dawson	San Jose, Cal.....	181
.....	E. R. Eldridge	Troy, Ala.....	182
.....	John McNeese, sup't	Lake Charles, La.....	183
.....	Rev. E. S. Hagen	Lebanon, Pa.....	184
.....	\$.25 Miss Amanda Landes	State normal school, Millersville, Pa.....	185
.....	M. O. Graves	Petoskey, Mich.....	186
.....	L. Halleck, pres.....	.....	187
.....	C. D. Hill	Port Leyden, N. Y.....	188
.....	W: S. Mack	Chicago, Ill.....	189
.....	W. E. Stone	Lafayette, Ind.....	190
.....	Rev. W: H. Hartman	Dixon, Ill.....	191
.....	.25 T. M. Priestly, pres.....	University Park, Col.....	192
.....	Rev. Dr William Griffin, pres.....	.....	193
.....	W. U. Hinman	Stillwater, N. Y.....	194
.....	William Verbeck, sup't.....	Manlius, N. Y.....	195
.....	D. F. Ritchie	98 Circular st. Saratoga Springs, N. Y.....	196
.....	E: E. Hale jr.....	762 Nott st. Schenectady, N. Y.....	197
.....	.50 Miss F. M. Henshaw	Amherst, Mass.....	198
.....	J: W. Hansel	709 Association bldg, Chicago, Ill.....	199
.....	"	"	200
.....	"	"	201
.....	S. B. Weston	1305 Arch st. Philadelphia, Pa.....	202
.....	Thomas Filben .....	.....	203
.....	W: M. Chase, director	51 W. 10th st. New York.....	204
.....	Rev. Ward Platt	226 Averill av. Rochester, N. Y.....	205
.....	H: M. Soper	Chicago, Ill.....	206
.....	.25 Mrs C. R. Minkler	Ashland, Or.....	207
.....	H. P. Andersen, treasurer.....	Asheville, N. C.....	208
.....	F. W. Barron	Spirit Lake, Ia.....	209
.....	E. L. Payne	Emporia, Kan.....	210
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.....	E. E. Moore	109 E. 45th st. New York.....	216
.....	Rev. John Gallagher, sup't.....	217
.....	C: A. Bennett	Teach. col. Morningside, W. 120th st. N. Y.....	218
.....	J. W. Terrell	Decherd, Tenn.....	219
.....	George Irvine	Georgetown, Tex.....	220
.....	C: H. Keyes	Pasadena, Cal.....	221
.....	L. M. Sniff	Angola, Ind.....	222
.....	B. T. Washington	Tuskegee, Ala.....	223
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				Opening
226	Ursinus summer school.....	Collegeville, Pa.....		
227	Utah university summer school	Salt Lake City, Utah	1894	15 Je
228	Vanderbilt university summer school..	Nashville, Tenn	1893	
229	Vashon college summer normal	Burton, Wash.....	1896	
230	Virginia summer school of methods....	Charlottesville, Va.....	1889	22 Je
231	Virginia university s. s. of law.....	University station.....	1870	1 J1
232	Sum. sch. of medicine(private)	"	1891	1 J1
233	Sum. class in chem. (private)	"	1888	1 J1
234	Sum. sch. of physical training	"		
235	Viroqua assembly	Viroqua, Wis.....	1895	16 Ag
236	Viroqua summer school.....	"		
237	Wabash college summer school.....	Crawfordsville, Ind.....		
238	Waseca Chautauqua assembly.....	Waseca, Minn.....	1885	3 J1
239	Washington and Jefferson college s....	Washington, Pa.....		
240	Waterloo Chautauqua assembly.....	Waterloo, Ia	1892	25 Je
241	Wellesley summer school.....	Wellesley, Mass.....	1895	8 J1
242	Western normal college s. s.	Shenandoah, Ia.....		
243	Western reserve univ. summer school..	Cleveland, O.....	1895	
244	Sum. school of theology.....	"	1895	
245	Wheaton college summer school.....	Wheaton, Ill.....	1879	28 Je
246	Willamette Valley assembly.....	Willamette Valley, Or....	1894	7 J1
247	Winfield Chautauqua assembly.....	Winfield, Kan.....	1891	16 Je
248	Wisconsin summer school	Madison, Wis	1887	6 J1
249	Sum sch. of library science..	"	1895	6 J1
250	Wooster university summer school.....	Wooster, O.....		
251	World's student conference.....	Northfield, Mass.....	1866	

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			Subjects	Lecturers		Entrance	Full course	Single course
226					University			\$5
227	8	325	75		University	\$1		15
228	17	34	410		Public school	25	\$5	
229					University		65	40
230	22				University		115	25
231	3				University		50	
232	5	120			Fayerweather gym		40	
233	1	32						
234								
235								
236								
237								
238								
239								
240					2	3	3	
241	5				College			12-20
242					Adelbert college		20	10
243					"			
244					College			5
245								
246								
247					3	1	1	50
248					2		15	
249							15	
250								
251								

a To Virginia teachers 33

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	Name	Address
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.....	Rev. H. T. Spangler, pres	Collegeville, Pa. 226
.....	H. C. Lewis	Univ. of Utah, Salt Lake City, Utah ... 227
.....	W. C. Branham	Vanderbilt univ. Nashville, Tenn. 228
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.....	W. A. Jenkins	Portsmouth, Va. 230
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.....	Dr W. A. Lambeth	University station, Charlottesville, Va. ... 234
.....	Rev. J. S. Parker 235
.....	Howard Miller	Viroqua, Wis. 236
.....	Prof. H. M. Kingery	Crawfordsville, Ind. 237
.....	Rev. H. C. Jennings, sup't.	Mankato, Minn. 238
.....	Prof. Schmitz	Washington, Pa. 239
\$.50	F. J. Sessions	Waterloo, Ia. 240
.....	Dr Helen L. Webster	Wellesley, Mass. 241
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.50	F. M. Warren	Adelbert college, Cleveland, O. 243
.....	C. F. Thwing	Adelbert college, Cleveland, O. 244
.....	Prof. D. A. Straw	Wheaton, Ill. 245
.....	Col. R. A. Miller, pres 246
.25	J. C. Miller, sup't 247
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Extension Bulletin

No. 20 June 1897

PUBLIC LIBRARIES NO. 6

REPORT OF PUBLIC LIBRARIES DIVISION 1896 INCLUDING STATISTICS OF NEW YORK LIBRARIES

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Extension Bulletin

No. 20 June 1897

REPORT OF PUBLIC LIBRARIES DIVISION 1896

To the regents of the University of the State of New York

I have the honor to report as follows for the year ending September 30, 1896.

INSPECTION

Libraries visited. In the year ending September 30, 1896, the inspector, William R. Eastman, visited 134 libraries in 41 counties, of which number 62 had not been previously reached and 29 are not connected with the University. 20 of the visited libraries received University charters within the year, three were admitted with existing charters and 10 others were registered as maintaining a proper standard. 50 of the visited libraries received grants of public library money. The number of inspections was 19 more than the previous year. The libraries of the state hospitals were visited at the request of the commission in lunacy to obtain information on which to act in furnishing books to these institutions under the provision of the 'Insanity law' of 1896. The following were visited:

Libraries visited during year ending September 30, 1896

1 Albany female academy library	10 Auburn, Seymour library
2 Albany free library	11 Ballston Spa, Ballston pub. library
3 Albany, Catholic union library	12 * Bath, Davenport free library
4 Albany, Young men's ass'n library	13 Bath Beach, New Utrecht free lib.
5 Albany, Young men's Christian association library	14 Bath-on-Hudson, North Greenbush public library
6 Albion public library	15 Bay Ridge free library
7 * Albion, Town library	16 * Blythebourne, St Jude's free lib.
8 Amsterdam library association	17 * Brooklyn library
9 Angelica, Wilson academy library	18 * Brooklyn, Kings co. med. soc. lib.

* Not connected with the University.

Libraries visited during the year, etc. (*continued*)

- | | |
|--|---|
| 19 Brooklyn, Pratt institute library | 57 Hornellsville, Horuell free library |
| 20 * Brooklyn, Union for Christian work library | 58 Ilion district library |
| 21 * Brooklyn, Young men's Christian association library | 59 * Ilion public library |
| 22 * Brooklyn, Young women's Christian association library | 60 Jamestown, James Prendergast free library |
| 23 Buffalo historical society library | 61 Jamestown union school library |
| 24 Buffalo library | 62 Jamestown, Young men's Christian association |
| 25 * Buffalo society of artists library | 63 Jordanville public library |
| 26 * Buffalo state hospital library | 64 Kenka college and institute lib. |
| 27 Buffalo, Canisius college library | 65 * Lancaster library |
| 28 Buffalo, Catholic institute library | 66 Lancaster union school library |
| 29 * Buffalo, Erie railway ass'n library | 67 Littlefalls union school library |
| 30 * Buffalo, German young men's ass'n library | 68 Lockport public library |
| 31 Buffalo, Grosvenor public library | 69 Long Island City public library |
| 32 Buffalo, High school library | 70 Malone, Village school dist. library |
| 33 * Buffalo, Sherman Jewett Williams memorial library | 71 Malone, Wadhams reading circle |
| 34 Buffalo, Univ. of Buf. med. dep't lib. | 72 Marathon, Peck memorial lib. ass'n |
| 35 Buffalo, Women's educational and industrial union library | 73 Mohawk public library |
| 36 Buffalo, Young men's Christian association library | 74 Montour Falls, Havana free library |
| 37 Canandaigua union school library | 75 * Moravia, Powers library |
| 38 Canandaigua, Wood library ass'n | 76 Moravia union school library |
| 39 Canastota union school library | 77 Morristown public library |
| 40 Canton free library | 78 Mount Vernon public library |
| 41 Crown Point chapel library | 79 New York, Aguilar free library, 59th street branch |
| 42 Dansville public library | 80 New York, Aguilar free library, 110th street branch |
| 43 Elizabethtown library association | 81 New York, Aguilar free library, 5th street branch |
| 44 Ellenville public library | 82 New York, Bryson library, Teachers college |
| 45 Fairport public library | 83 * New York, City library |
| 46 * Flatbush school library dist. no. 1 | 84 * New York, Kingsbridge free library association |
| 47 Flushing library association | 85 * New York, Lenox library |
| 48 Fort Hamilton free library | 86 New York free circulating library, Bloomingdale branch |
| 49 Fredonia, Darwin R. Barker lib. | 87 New York, St Agnes free library |
| 50 Freeport public library | 88 New York, Washington hights free library |
| 51 Fulton public library | 89 * New York, Young men's Christian ass'n, railroad branch library |
| 52 * Gouverneur library association | 90 Niagara Falls public library |
| 53 Groton public library | 91 North Tonawanda public library |
| 54 Hammondsport public library | 92 Nyack library |
| 55 Haverstraw, Kings daughters public library | 93 Ogdensburg public library |
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Libraries visited during the year, etc. (*continued*)

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95 Piermont free library	115 Syracuse, Central library
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97 Pleasantville library association	117 Tarrytown, Young men's, lyceum library
98 Port Henry, Sherman free library	118 Tonawanda public library
99 Port Jervis free library	119 Utica public library
100 Port Washington free library	120 * Utica state hospital library
101 Potsdam public library and reading room	121 VanEtten public library
102 * Poughkeepsie, Hndson river state hospital library	122 Vernon public library
103 Poughkeepsie Vassar college lib.	123 Vernon union school library
104 * Rhinecliff reading room	124 * Wakefield public library
105 Riverhead free library	125 Waterloo historical society lib.
106 Riverhead union school library	126 Watertown public school library
107 Rochester, Central library	127 Watkins public library
108 Rochester, Court of appeals lib.	128 West Winfield free library
109 * Rochester, Reynolds library	129 Westfield, Patterson library
110 Rondout, Ponckhookie pub. lib.	130 Westfield union school library
111 * Seneca Falls free library	131 Westport library association
112 Sherburne public library	132 * Willard state hospital library
113 Southampton, Rogers mem'ral lib.	133 Yonkers, Women's institute lib.
	134 Yonkers public library

The 155 libraries under University inspection are as follows:

Chartered by University	97
Unregistered charter	1
Admitted to University	21
Registered	36

Total	155
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ORGANIZATION OF NEW LIBRARIES

Libraries chartered, admitted and registered during the year.

During the year 13 absolute and 10 provisional library charters were granted by the regents, involving the transfer of 15,688 volumes in 15 existing libraries, of which 13 were district libraries in the hands of school authorities.

Four libraries, at Herkimer, Long Island City, Vernon and Westfield were chartered where there was no previously existing library.

One library incorporated by act of legislature was reincorporated, one provisional charter was made absolute, one charter was amended and one unregistered charter granted. Three libraries incorporated under general laws were admitted to the University. 15 were registered as maintaining a proper standard, one of which belonged to a University institution. The following tables show the location, name, number of volumes and property of each library chartered, admitted and registered during the year, and also libraries transferred.

* Not connected with the University.

Libraries chartered, admitted and registered during year ending Sept.

30, 1896

Chartered

No.	Post-office	Libraries	Vols.	Property
1	Alexandria Bay..	Holland library p.....	865	\$539
2	Angelica	Angelica library association	1650	1955
3	Canton	Canton free library	875	1000
4	Fairport	Fairport public library p.....	550	590
5	Freeport	Freeport public library p.....	100	384 18
6	Fulton.....	Fulton public library	1000	1000
7	Groton	Groton public library p.....	500	450
8	Haverstraw	Kings daughters public library	700	1000
9	Herkimer	Herkimer free library	2000	33,000
10	Hunter	Hunter public library p.....	246	383
11	Long Island City.	Long Island City public library	5000	5000
12	Mount Vernon. .	Mount Vernon public library	4 00	2650
13	Penn Yan	Penn Yan public library	1400	1641 25
14	Port Washington.	Port Washington free library p.....	239	200
15	Potadam	Potadam public library and reading room	1286	2427
16	Rondout	Ponckhockie public library p.....	800	567 26
17	Sherburne.....	Sherburne public library p.....	975	600
18	Van Etten	Van Etten public library p.....	390	404 50
19	Vernon	Vernon public library p.....	.....	90 70
20	Watkins.....	Watkins public library	2200	1815
21	Westfield.....	Patterson library .....	.....	100,000
<i>Reincorporated</i>				
22	Canandaigua.....	Wood library association	4500	3511
Total			26,866	\$158,477 88

Provisional charter made absolute

Camden.....	Camden library association.....	1180	2311 33
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Charter amended

No.	Post-office	Libraries	Vols.	Property
—	Albany	Albany free library.....	2634	\$1300
<i>Unregistered charter</i>				
| Brooklyn.....	| Brooklyn public library association			
<i>Admitted with existing charters</i>				
1	Malone	Wadhams reading circle.....	22	482 51
2	Pleasantville	Pleasantville library association	500	1095
3	Southampton	Rogers memorial library	1000	23,455
Total			1523	\$40,083 51

Registered

1	Albany	Y. M. A. library	16,895	18,366
2	Albany	Y. M. C. A. library.....	3872	6108
3	Auburn	Seymour library	12,365	46,692 42
4	Buffalo	Catholic institute library	6380	153,600
5	Flushing	Flushing library association	5800	17,945
6	New York	Agullar free library, 197 E. B'dway	28,510	121,115
7	New York	Agullar free library, 59th st. branch	2246	1500
8	New York	Agullar free library, 110th st. branch	11,006	2178 72
9	New York	Riverside free library	1170	16,750
10	New York	Teachers college, Bryson library	7000	9868 25
11	New York	Washington hights free library	9844	21,500
12	Olean	Forman library	4500	87
13	Piermont	Piermont free library	3615	27,297 24
14	Salem	Bancroft public library	4000	25,050
15	Waterloo.....	Waterloo library and historical society.....		
Total			117,130	\$473,360 88
Grand total			147,549	\$671,861 22

a Included in Agullar free library 197 E. Broadway.

p,Provisional charter.

Library transfers approved during year ending Sept. 30, 1896

	From	To	Vols.
1	Bd of educ. of Alexandria Bay.....	Holland lib. of Alexandria Bay	365
2	Trustees of Wilson academy.....	Angelica library association...	1650
3	Trustees of Fairport union school..	Fairport public library.....	550
4	Bd of educ. dist. no. 9, Hempstead.	Freeport public library.....	100
5	Bd of educ. dist. no. 1, Volney.....	Fulton public library.....	† 1000
6	Bd of educ. dist. no. 8, Groton.....	Groton public library.....	500
7	Trustees of school dist. no. 2, Hunter	Hunter public library.....	297
8	Bd of educ. of Jamestown.....	James Prendergast library ass'n	2205
9	Bd of educ. of Mt Vernon.....	Mt Vernon public library.....	4000
10	Bd of educ. of Penn Yan.....	Penn Yan public library.....	1400
11	Potsdam public readingroom and library.....	Potsdam public library and reading room.....	1286
12	Bd of educ. of dist. no. 4, Kingston.	Ponckhockie public library....	860
13	Bd of educ. dist. no. 7, Sherburne..	Sherburne public library.....	975
14	Voters of school dist. no. 1, Van Etten	Van Etten public library.....	390
15	Bd of educ. of dist. no. 1, Watkins..	Watkins public library.....	500
16	Watkins library association.....	Watkins public library.....	1815
			17,893

Founding and control. The following tables show by what action the chartered University libraries have been established in each of the past six years and by whom their trustees are elected. Out of a total of 97, 31 boards of library control are appointed by the local boards of education and 22 by school districts, showing that a majority of all are still closely related to the school system.

Founding of chartered libraries for years ending September 30

Established by	1891	1892	1893	1894	1895	1896	Total
School authorities.....	15	10	9	10	44
School districts.....	1	2	3	3	2	11
Village trustees.....	2	3	.....	.....	5
Village.....	1	1
Town.....	1	.....	1
Common councils.....	1	2	.....	1	4
Library associations.....	1	.....	4	4	4	4	17
Other associations.....	2	2	4
Public meetings.....	1	1	.....	2
Churches.....	1	2	.....	3
Private gifts.....	1	1	1	2	5
Total.....	1	1	25	25	23	22	97

Control of chartered libraries for years ending September 30

Trustees chosen by	1891	1892	1893	1894	1895	1896	Total
Board of education.....			5	8	9	9	31
School trustees.....					1		1
School district.....		1	12	4	2	3	22
Village trustees.....				2			2
Village voters.....			2			1	3
Town.....					1		1
Mayor with consent of council.....				2			2
Library trustees.....			4	6	7	3	20
Library association.....	1				2	4	7
Other associations.....					1	2	3
Other library.....				1			1
Contributors of \$1 each.....			1	2			3
Individual benefactor.....			1				1
Total.....	1	1	25	25	23	22	97

Library founders. The following libraries have been established by individual gifts within the past four years.

Crandall free library at Glens Falls was founded by Henry Crandall and chartered in 1893. It has 6319 volumes and reported a circulation of 34,263 for 1896.

Sherman free library at Port Henry was founded by George R. Sherman and his wife in 1887 and chartered in 1894. It has 4954 volumes and a circulation of 7959.

Sinclairville free library was established by a gift of books from Elbridge P. McElroy in 1870. The library was chartered December 1894. It has 1450 volumes.

Herkimer free library was founded by Judge Robert Earl and his wife who relinquished their home and gave it with 2000 books for a public library. It was chartered November 1895. It has 4619 volumes.

Patterson library at Westfield, chartered in 1896, was founded by a bequest of \$100,000 from Hannah W. Patterson.

Other free libraries founded by private gifts and incorporated by the legislature or under general laws have been admitted to the University as follows:

Erwin library and institute, Boonville
 Grosvenor public library, Buffalo
 James Prendergast free library, Jamestown
 Southworth library association, Dryden
 Peck memorial library, Marathon
 Hazard library association, Poplar Ridge
 Jervis library, Rome
 Rogers memorial library, Southampton.

Library trustees. In one charter granted within the year the village president and town supervisor have been designated ex officio library trustees; in another the village president and school superintendent and

in another the mayor of the city and school superintendent. There are now 10 libraries whose governing boards include ex officio trustees.

Of the new libraries of the year, two have three trustees each, 16 have five, three have seven and one 17. Of the entire 97 chartered libraries the majority have five trustees.

22 have 3 trustees each	3 have 9 trustees each
49 " 5 "	1 has 10 "
4 " 6 "	2 have 12 "
11 " 7 "	1 has 13 "
2 " 8 "	2 have 17 "

Libraries admitted. Three libraries already incorporated under general laws and having property amounting to about \$40,000 were admitted to the University during the year.

Registered libraries. 15 have been added to the list of libraries registered as maintaining a proper standard. They have 117,130 volumes and \$473,350.83 in property, and for 1896 reported a circulation of 404,424 volumes. Most of them are important institutions to which this registry is a necessary condition of securing local subsidies from cities or villages.

Unregistered charter. The Brooklyn public library association was organized to promote the establishment of a free public library for the city of Brooklyn. Having no books with which to carry on library work an unregistered charter was granted to give them legal existence and make it possible for them to receive gifts of money or books.

LIBRARIES AND INSTITUTES IN THE UNIVERSITY

The following table of libraries and institutes in the University includes all that have come into this relation under the University law of 1892.

The state library and the libraries of 502 teaching institutions are not included nor those registered as maintaining a proper standard. The list contains those only that have a distinct corporate existence and are in the University by charter or admission. Many details are given that could not readily be obtained for other libraries. Except the Grosvenor library in Buffalo all are free for the circulation of books.

The number of library and institute corporations in the University is 118. Three of these were originally chartered by special acts of legislature, 20 were incorporated under general laws and 97 now hold standard University charters, two having been reincorporated. 48 of the charters are provisional for five years from the date of the grant, indicating that the property, including books, is not yet valued at \$1000. One provisional charter has been made absolute during the past year.

The libraries in the University, located in 47 different counties, contain 327,310 volumes, or 68,884 more than in 1895. Their circulation for the year has reached 988,471 volumes.

a Libraries and institutes in the

No.	Post-office	County	NAME
1	Addison	Steuben	Addison public library
2	Albany	Albany	Albany free library
3	Albion	Orleans	Albion public library
4	Alexandria Bay	Jefferson	Holland library of Alexandria Bay
5	Allen's Hill	Ontario	Allen's Hill free circ. lib. ass'n
6	Amsterdam	Montgomery	Amsterdam library ass'n
7	Angelica	Allegany	Angelica library ass'n
8	Arkport	Steuben	Arkport public library
9	Ballston Spa	Saratoga	Ballston public library
10	Bath beach	Kings	New Utrecht free library
11	Bath-on-Hudson	Rensselaer	North Greenbush dist. no. 6 pub. lib.
12	Bay Ridge	Kings	Bay Ridge free library
13	Belmont	Allegany	Belmont lit. and hist. soc. free lib.
14	Boonville	Oneida	Erwin library and institute
15	Buffalo	Erie	Grosvenor public library
16	Camden	Oneida	Camden library ass'n
17	Canaan Four Corners	Columbia	Canaan public library
18	Canandaigua	Ontario	Wood library ass'n
19	Canton	St Lawrence	Canton free library
20	Catakill	Greene	Catakill public library
21	Claverack	Columbia	Claverack free lib. and reading room ass'n ...
22	Cornwall	Orange	Cornwall public library
23	Cornwall-on-Hudson	Orange	Cornwall-on-Hudson pub. lib.
24	Crown Point	Essex	Chapel library
25	Dansville	Livingston	Dansville public library
26	Dryden	Tompkins	Southworth library ass'n
27	East Chatham	Columbia	East Chatham public library
28	Easton	Washington	Easton library ass'n
29	Elizabethtown	Essex	Elizabethtown library ass'n
30	Ellenville	Ulster	Ellenville public library
31	Fairport	Monroe	Fairport public library
32	Fort Hamilton	Kings	Fort Hamilton free library
33	Fort Plain	Montgomery	Fort Plain free library
34	Freeport	Queens	Freeport public library
35	Fulton	Oswego	Fulton public library
36	Gilbertsville	Otsego	Gilbertsville free library
37	Glen Cove	Queens	Glen Cove public library
38	Glen Haven	Cayuga	Glen Haven public library
39	Glens Falls	Warren	Crandall free library
40	Groton	Tompkins	Groton public library
41	Haverstraw	Rockland	Kings daughters public library
42	Herkimer	Herkimer	Herkimer free library
43	Hornellsville	Steuben	Hornell free library ass'n
44	Hunter	Greene	Hunter public library
45	Ilion	Herkimer	Ilion district library
46	Jamestown	Chautauqua	James Prendergast library ass'n
47	Jordanville	Herkimer	Jordanville public library
48	Joshua's Rock	Warren	Mountainside free library
49	Keene Valley	Essex	Keene Valley public library
50	Lake George	Warren	Lake George free library
51	Lake Placid	Essex	Lake Placid public library
52	Liberty	Sullivan	Liberty public library
53	Liverpool	Onondaga	Liverpool public library
54	Lockport	Niagara	Lockport public library
55	Long Island City	Queens	Long Island City public library

a Not including the state library or the
 b R incorporated by regents
 L " " legislature
 G " " under general law

University, June 30, 1896

INCORPORATED		YEAR ENDING JUNE 30, 1896—VOLUMES				TRUSTEES		No.
By a	Date	Admitted	Added	Total	Circulation	No.	Elected by	
R	9 F 96	9 F 96	209	2412	6731	3	District	1
R	21 Je 96	21 Je 96	460	3094	10,123	10	Contributors of \$1 each during year	2
R	9 F 96	9 F 96	118	2872	8069	9	Mem. of bd of educ'n trustees ex officio	3
Rp	19 Mr 96	19 Mr 96	798	708	788	5	Bd of education	4
Rp	28 F 96	28 F 96	.....	411	825	5	Corporation	5
G	3 O 91	26 Je 95	776	3109	29,512	19	Corporation	6
R	21 N 95	21 N 95	84	1584	2652	7	Corporation	7
Rp	5 JI 94	5 JI 94	.....	.....	.....	6	Bd of education	8
Rp	9 F 96	9 F 96	13	851	6149	5	Village	9
R	28 F 96	28 F 96	261	1549	10,018	7	Corporation	10
Rp	21 Je 96	21 Je 96	117	11350	6844	3	Bd of education	11
R	21 Je 96	21 Je 96	583	3943	12,949	9	Corporation	12
R	9 F 96	9 F 96	269	1636	4765	5	Society	13
Q	6 Je 96	8 F 94	200	2696	7773	5	Corporation	14
L	11 Ap 96	5 Je 94	683	40,000	.....	8	Mayor and common council	15
Rp	7 JI 91	7 JI 91	244	1220	10,978	5	.....	16
Rp	24 Je 96	24 Je 96	46	604	1500	5	School district	17
L	17 Ap 96	24 Je 96	.....	15500	12400	14	12 Corp. town sup'or & vil. pres. ex officio	18
R	19 Mr 96	19 Mr 96	188	981	4590	5	Corporation	19
R	9 F 96	9 F 96	406	2208	14,286	3	Bd of education	20
G	23 Mr 91	5 Je 94	104	859	2647	11	Corporation	21
Rp	28 F 96	28 F 96	80	525	600	5	Bd of education	22
Rp	26 Je 96	26 Je 96	56	814	1291	5	Bd of education	23
Rp	12 D 94	12 D 94	48	1077	12145	5	1 for life, 3 by bd of ed'n, sch. pr. ex officio	24
R	13 D 96	13 D 96	381	2280	12,441	5	Bd of education	25
G	— Ap 96	12 D 94	207	5912	15000	7	Corporation	26
Rp	9 F 96	9 F 96	150	788	1339	3	School district	27
G	— 79 28 F 96	95 49	698	1247	7	Corporation	28	
R	8 O 94	26 Je 96	145	1566	3051	6	Corporation	29
G	21 Je 96	21 Je 96	67	1657	17,143	5	School district	30
Rp	21 N 96	21 N 96	365	365	7514	5	Bd of education	31
R	13 D 96	13 D 96	1278	3401	8258	6	Corporation	32
R	5 Je 94	5 Je 94	45	1070	5699	8	Contributors of \$1 previous year	33
Rp	21 N 96	21 N 96	759	759	1174	5	Bd of education	34
R	21 N 96	21 N 96	.....	.....	.....	5	District	35
G	8 My 91	12 D 94	.....	1094	3400	8	Corporation	36
Rp	12 D 94	12 D 94	416	1572	2226	5	3 by sch. dist., 2 by bd of educ'n	37
Rp	13 D 96	13 D 96	167	727	1336	5	District	38
R	9 F 96	9 F 96	399	7559	34,263	17	Henry Crandall	39
Rp	19 Mr 96	19 Mr 96	11	550	11800	5	Bd of education	40
R	21 N 96	21 N 96	1150	1150	3583	5	Kings daughters	41
R	21 N 96	21 N 96	4619	4619	10,085	17	15 by corp. pres. vil. & sup'tsch. ex officio	42
G	6 Ap 96	31 Je 93	496	10,000	33,811	9	Corporation	43
Rp	19 Mr 96	19 Mr 96	299	391	.....	2	District	44
R	13 D 96	13 D 96	47	1010	5063	5	M'g's of Illon pub. lib. are trus. ex officio	45
L	29 Ja 80	5 Je 94	2523	12,587	51,946	7	Corporation	46
Rp	21 Je 96	21 Je 96	102	771	2254	5	School district	47
Rp	5 JI 94	5 JI 94	105	443	1000	7	Corporation	48
Rp	13 D 96	13 D 96	110	960	1560	9	Association	49
Rp	28 F 96	28 F 96	75	523	768	5	Corporation	50
R	12 D 94	12 D 94	61	1126	3398	5	District	51
Rp	5 Je 94	5 Je 94	79	1104	1610	5	Bd of education	52
Rp	21 Je 96	21 Je 96	.....	719	2641	3	School district	53
R	9 F 96	9 F 96	333	5663	15,736	3	Bd of education	54
R	19 Mr 96	19 Mr 96	75000	75000	.....	5	Corporation	55

Libraries belonging to teaching institutions
p Provisional charter

^a Libraries and institutes in the

No.	Post-office	County	Name
56	Madalin	Dutchess	Tivoli public library
57	Malone	Franklin	Wadhams reading circle
58	Marathon	Cortland	Peck memorial library ass'n
59	Mellenville	Columbia	Mellenville public library
60	Mohawk	Herkimer	Mohawk public library
61	Montour Falls	Schuyler	Havana free library
62	Morristown	St. Lawrence	Morristown public library
63	Mt. Vernon	Westchester	Mt. Vernon public library
64	Nanuet	Rockland	Nanuet public library
65	Nassau	Rensselaer	Nassau free library
66	New Rochelle	Westchester	New Rochelle public library
67	New York	New York	St. Agnes free library
68	Newfield	Tompkins	Newfield public library
69	Niagara Falls	Niagara	Niagara Falls public library
70	North Parma	Monroe	North Parma public library
71	North Tonawanda	Niagara	North Tonawanda public library
72	Nyack	Rockland	Nyack library
73	Ogdensburg	St. Lawrence	Ogdensburg public library
74	Oneonta	Otsego	Oneonta public library
75	Oyster Bay	Queens	Oyster Bay peoples library
76	Penn Yan	Yates	Penn Yan public library
77	Philmont	Columbia	Philmont public library
78	Pine Plains	Dutchess	Pine Plains free library
79	Plattsburg	Clinton	Plattsburg public library
80	Pleasantville	Westchester	Pleasantville library association
81	Pocantico Hills	Westchester	Pocantico Hills lyceum
82	Poplar Ridge	Cayuga	Hazard library ass'n
83	Port Henry	Essex	Sherman free library
84	Port Jervis	Orange	Port Jervis free library
85	Port Washington	Queens	Port Washington free library
86	Potadam	St. Lawrence	Potadam pub. lib. and reading room
87	Rockville Center	Queens	Rockville Center public library
88	Rome	Oneida	Jervis library ass'n
89	Rondout	Ulster	Ponckhockie public library
90	Saugerties	Ulster	Saugerties public library
91	Schenectady	Schenectady	Schenectady free public library
92	Schuylerville	Saratoga	Schuylerville public library
93	Sea Cliff	Queens	Sea Cliff public library
94	Sherburne	Chenango	Sherburne public library
95	Sidney	Delaware	Sidney public library
96	Sinclairville	Chautauqua	Sinclairville free library
97	Sing Sing	Westchester	Sing Sing public library
98	Routhampton	Suffolk	Rogers memorial library
99	Springfield Center	Otsego	Springfield free library
100	Springville	Erle	Springville public library
101	Syracuse	Onondaga	Syracuse central library
102	Tonawanda	Erle	Tonawanda public library
103	Troy	Rensselaer	Troy children's neighborhood library
104	Troy	Rensselaer	Young women's ass'n of the city of Troy
105	Trumansburg	Tompkins	Trumansburg public library
106	Utica	Oneida	Utica public library
107	Van Etten	Chemung	Van Etten public library
108	Vernon	Oneida	Vernon public library
109	Waterford	Saratoga	Waterford public library
110	Waterville	Oneida	Waterville public library

^a Not including the state library or the
^b R incorporated by regents
L " legislature
G " under general law

University, June 30, 1896 (continued)

INCORPORATED	Date	Admitted	YEAR ENDING JUNE 30, 1896—VOLUMES			TRUSTEES		No.
			Added	Total	Circulation	No.	Elected by	
Rp	5 Je 94	5 Je 94	245	671	1768	3	School district	56
G	18 Je 93	21 N 95	463	500	800	5	.....	57
G	12 D 93	5 Je 95	?	1000	2484	5	Corporation	58
Rp	21 Je 93	21 Je 93	82	421	408	3	School district	59
Rp	13 D 93	13 D 93	95	911	2632	3	District	60
Rp	5 Je 94	5 Je 94	177	806	4456	5	Corporation	61
Rp	5 Je 94	5 Je 94	108	315	3199	5	Corporation	62
R	19 Mr 96	19 Mr 96	469	5594	3378	5	Bd of education	63
Rp	12 D 94	12 D 94	105	934	1150	3	School district trustees	64
R	9 F 93	9 F 93	135	613	2500	12	Association	65
R	5 JI 94	5 JI 94	571	4265	16,511	5	Bd of education	66
Rp	5 Je 94	5 Je 94	968	1280	15,778	5	Corporation	67
Rp	12 D 94	12 D 94	57	545	1688	6	5 by lib. ass'n pres. bd of educ'n ex officio	68
Rp	28 F 95	28 F 95	595	3888	18,510	5	3 by bd ed., mayor & pres. bd educ'n ex off.	69
Rp	9 F 93	9 F 93	.....	.....	.....	5	Village trustees	70
R	13 D 93	13 D 93	415	2270	8547	5	Bd of education	71
G	10 8 90	5 Je 94	542	3914	21,323	11	Corporation	72
Rp	12 D 93	12 D 93	1241	6946	14,818	5	Mayor	73
Rp	9 F 93	9 F 93	259	4493	19,300	5	School district	74
Rp	12 D 94	12 D 94	.....	.....	.....	7	Corporation	75
R	21 N 95	21 N 95	276	1655	4622	5	Bd of education	76
Rp	13 D 93	13 D 93	130	940	3876	2	District	77
Rp	26 Je 95	26 Je 95	78	2104	3000	5	Town auditors trustees ex officio	78
Rp	5 Je 95	5 Je 94	484	914	2768	12	Village trustees	79
G	7 My 94	21 N 95	181	750	3000	8	Corporation	80
G	29 Mr 93	12 D 94	19	1180	1117	9	Corporation	81
G	31 D 93	26 Je 95	250	1500	1280	6	Corporation	82
R	13 D 93	13 D 93	4	4945	7959	7	According to Sherman deed of trust	83
R	29 8 92	29 8 92	1253	7226	21,921	5	School district	84
Rp	21 N 95	21 N 95	58	370	855	7	Corporation	85
R	19 Mr 95	19 Mr 95	1	1247	548	5	Village	86
Rp	5 Je 91	5 Je 91	113	1581	6450	5	Bd of education	87
G	13 D 94	28 F 95	1233	10,577	40,102	9	Corporation	88
Rp	21 N 95	21 N 95	118	943	4080	3	Bd of education	89
R	5 Je 94	5 Je 94	475	1799	8174	3	Bd of education	90
R	12 D 94	12 D 94	3905	3905	17,692	7	5 by corp. mayor & sup't of sch. ex officio	91
Rp	12 D 94	12 D 94	.....	.....	.....	3	Bd of education	92
Rp	12 D 94	12 D 94	121	650	2612	5	Sea Cliff improvement ass'n	93
Rp	19 Mr 95	19 Mr 95	.....	990	800	5	Bd of education	94
R	26 Je 95	26 Je 95	243	1300	4330	5	Bd of education	95
R	12 D 94	12 D 94	.....	1430	13000	6	Corporation	96
Rp	9 F 93	9 F 93	407	3927	14,158	3	School district	97
G	24 Ja 95	24 Je 96	1000	1000	1640	6	Corporation	98
Rp	26 Je 95	26 Je 95	227	227	1239	3	Springfield library ass'n	99
Rp	13 D 93	13 D 93	430	2180	8514	3	Bd of education	100
R	13 D 93	13 D 93	4370	28,009	91,705	7	5 by mayor, mayor & sup't of sch. ex off.	101
R	13 D 93	13 D 93	240	1750	2463	3	Bd of education	102
Rp	12 D 94	12 D 94	137	730	6021	5	Corporation	103
G	15 Je 95	2 D 94	160	1450	2367	5	Corporation	104
Rp	21 Je 95	21 Je 95	8	832	2480	6	Bd of education	105
R	21 Je 95	21 Je 95	3037	21,187	118,167	7	5 by corp. mayor & chm. sch. com. ex off.	106
Rp	21 N 95	21 N 95	100	990	530	5	District	107
Rp	21 N 95	21 N 95	161	161	746	5	Young people's union	108
Rp	28 F 95	28 F 95	.....	.....	.....	3	Bd of education	109
Rp	28 F 95	28 F 95	672	1890	13450	3	Bd of education	110

Libraries belonging to teaching institutions
p Provisional charter

^a Libraries and institutes in the

No.	Post-office	County	NAME
111	Watkins.....	Schuyler.....	Watkins public library
112	Wellsville	Allegany	Wellsville public library
113	West Winfield.....	Herkimer	West Winfield free library
114	Westbury	Cayuga.....	Green Wood library.....
115	Westfield	Chautauqua.....	Patterson library.....
116	Westport	Essex	Westport library ass'n.....
117	Yonkers	Westchester.....	Women's Institute of Yonkers
118	Yonkers.....	Westchester ...	Yonkers public library

^a Not including the state library or the^b R incorporated by regents

L " legislature

G " under general law

University, June 30, 1896 (concluded)

INCORPORATED		Admitted	YEAR ENDING JUNE 30, 1896—VOLUMES			TRUSTEES		No.
By	Date		Added	Total	Circulation	No.	Elected by	
R	19 Mr 96	19 Mr 96	123	9488	2517	3	Bd of education	111
Rp	5 Je 94	5 Je 94	656	2082	6217	7	Village trustees	112
Rp	13 D 94	13 D 94	91	1503	5592	6	Bd of education	113
Rp	21 Je 98	21 Je 98	25	941	332	8	School district	114
R	19 Mr 96	19 Mr 96	-----	-----	-----	7	Corporation	115
G	16 N 87	21 Je 96	75	1501	4307	6	Corporation	116
G	22 O 92	5 Je 94	377	2662	7686	7	Corporation	117
R	9 F 98	9 F 98	630	11,083	47,311	5	Bd of education	118
			53,717	327,310	988,471			

libraries belonging to teaching institutions
p Provisional charter

Comparative summary of libraries and institutes in the University 1893-96

	1893	1894	1895	1896	Increase for one year
No. of libraries.....	29	61	93	118	25
Volumes.....	69,956	185,108	258,426	327,310	68,884
Circulation.....	192,899	463,963	670,580	988,471	317,891
Circulation average per 100 vols.	276	250	259	302	43

Growth of free libraries in the University. In the report for 1895 a table was given showing one and two years' increase in volumes and circulation of 28 libraries admitted to the University during the year ending Sept. 30, 1893.

The same table is here repeated with the growth to Sept. 30, 1896, added. This shows a continued and uniform advance of these 28 libraries as a group. In three years their number of volumes increased 45 % and their circulation 122 %. The average circulation for 1896 was 427 volumes for each 100, as against 278 for each 100 in 1893, while the average for the free libraries of the state is now but 300 volumes for each 100.

The circulation of a few of the libraries in this table fell off a little the last year, while others made a marked advance, as:

Albany free library from 6,356 to 10,129 or 59 %;

Port Jervis free library from 13,578 to 21,991 or 62 %;

Utica public library from 82,421 to 118,167 or 43 %;

Yonkers public library from 31,192 to 47,211 or 51 %.

These were among the first libraries to come into relation with the University.

Another table is given of libraries admitted in 1895, with a comparison of their work in 1895 and 1896. They are 33 in number with a total of 48,791 volumes and a circulation of 70,834 in 1895. In one year they added 45 % to their books and 167 % to their previous circulation. The Jervis library at Rome lent 40,000 volumes where none had been issued before, and the Schenectady library began with a circulation the first year of 17,692.

The following advanced their circulation largely:

Amsterdam library association from 9669 to 29,512 or 205 %;

New Utrecht library at Bath Beach from 5654 to 10,000 or 76.8 %;

Niagara Falls library from 9467 to 18,510 or 95.5 %;

Waterford library from 1672 to 7892 or 372 %;

Waterville library from 1350 to 3450 or 155 %.

Several others reported a circulation nearly or quite double that of the preceding year.

The average circulation of the group was 326 volumes for each 100 in 1896 as compared with 145 volumes for each 100 the previous year.

Three years' growth of free libraries admitted to the University during year ending September 30, 1893

No.	LIBRARY	1893		1894		1895		1896	
		Vols.	Chc'n	Vols.	Chc'n	Vols.	Chc'n	Vols. ¹	Chc'n
1	Addison public library.....	2035	.....	1750	2438	1969	5614	2412	6731
2	Albany free library.....	1523	1429	1914	2325	2634	6356	3094	10,129
3	Albion public library.....	2800	3048	2950	3650	2960	11,142	2872	8089
4	Ballston public library.....	373	550	856	3244	838	6653	851	6149
5	Bay Ridge free library.....	2400	7200	2976	9177	3490	12,226	3943	12,949
6	Belmont lit. and hist. soc. free lib.....	785	720	971	621	1368	3371	1626	4766
7	Canaan public library.....	498	.....	† 513	† 1000	† 555	† 1200	604	1500
8	Catskill public library.....	1114	325	1291	9830	1674	13,718	2302	14,286
9	αCrandall free library (Glens Falls).....	4729	36,485	5891	45,058	6015	38,529	6319	34,263
10	East Chatham public library.....	300	731	460	1114	632	1151	788	1339
11	Ellenville public library.....	534	.....	1525	12,561	1606	16,292	1657	17,143
12	Green Wood pub. lib. (Westbury).....	180	180	197	303	217	197	241	322
13	Hornell free library (Hornellsville).....	10,000	24,000	† 10,000	27,085	† 10,000	30,321	10,000	33,811
14	Jordanville public library.....	495	115	545	2010	669	2189	771	2264
15	Liverpool public library.....	601	540	601	1540	719	2991	719	2641
16	Lockport public library.....	4956	† 1950	5126	16,000	5330	15,371	5663	15,728
17	Mellenville public library.....	338	500	338	† 820	338	266	421	408
18	Nassau free library.....	500	300	425	1650	478	3612	613	2500
19	New Rochelle public library.....	2105	.....	1888	3543	2714	10,018	3285	16,511
20	N. Greenbush dist. no. 6 pub. lib.....	† 902	1427	1058	8629	1259	5079	1360	6344
21	N. Parma public library.....	301	1054	409	1000	648	2787	648	3622
22	Oneonta public library.....	2944	15,096	3676	16,877	4235	19,369	4493	19,300
23	Port Jervis free library.....	4803	6555	4217	9836	6124	13,578	7286	21,991
24	Sing Sing public library.....	3218	9207	3283	11,896	3537	13,716	3927	14,158
25	Trumansburg public library.....	.....	.....	624	500	† 804	2340	832	2480
26	Utica public library.....	10,000	49,706	13,863	55,122	17,936	82,421	21,187	118,167
27	Westport library ass'n.....	1225	375	1403	4795	1426	5590	1501	4307
28	Yonkers public library.....	9830	31,426	10,164	33,378	10,403	31,192	11,033	47,211
	Total.....	69,289	192,899	79,914	291,902	90,558	357,289	100,438	429,099
				69,289	192,899	79,914	291,902	90,558	357,289
	Increase.....	.....	.....	10,625	99,003	10,644	65,387	9880	71,810

a Includes union school library in 1898 and 1894

**One year's growth of free libraries admitted to the University during year
ending Sept. 30, 1895**

No.	LIBRARY	1895		1896	
		Vols.	Circ'n	Vols.	Circ'n
1	Allen's Hill free circulating library ass'n	411	343	411	825
2	Amsterdam library association	2,368	9,669	3,109	29,512
3	Bath Beach, New Utrecht free library...	1,341	5,654	1,549	10,013
4	Cornwall public library	438	.....	525	600
5	Cornwall-on-Hudson public library.....	812	1,150	814	1,221
6	Crown Point chapel library	1,021	1,765	1,077	2,145
7	Dryden, Southworth library association.	5,700	5,000	5,912	5,000
8	Easton library association	680	583	693	1,247
9	Elizabethtown library association	1,421	1,750	1,566	3,051
10	Gilbertsville free library	1,094	3,445	1,094	3,400
11	Glen Cove public library	938	.....	1,572	2,226
12	Lake George free library	453	.....	523	763
13	Lake Placid public library	1,103	2,818	1,135	3,393
14	Marathon, Peck memorial library ass'n..	.....	.....	1,000	2,484
15	Nanuet public library	771	780	934	1,150
16	Newfield public library	488	370	545	1,682
17	Niagara Falls public library	3,641	9,467	3,888	18,510
18	Oyster Bay, Peoples library	650	2,160	1,702	3,070
19	Pine Plains free library	2,028	.....	2,104	2,000
20	Pocantico Hills lyceum library	1,126	1,050	1,130	1,117
21	Poplar Ridge, Hazard library	800	.....	1,500	1,260
22	Rome, Jervis library association	9,315	.....	10,577	40,162
23	Schenectady free public library	3,000	.....	3,905	17,692
24	Schuylerville public library	379	.....	.....	.....
25	Sea Cliff public library	529	1,316	650	2,612
26	Sidney public library	1,137	4,147	1,300	4,320
27	Sinclairville free library	1,450	2,006	1,450	3,000
28	Springfield free library .....	.....	.....	227	1,329
29	Troy, Children's neighborhood library..	571	8,370	790	6,021
30	Troy, Young womens' association library.	1,190	2,349	1,450	2,987
31	Waterford public library	1,366	1,672	1,672	7,892
32	Waterville public library	1,158	1,350	1,830	3,450
33	West Winfield free library	1,412	3,620	1,503	6,592
Total		48,791	70,834	58,137 48,791	189,726 70,834
Increase for one year .....		.....	.....	9,346	118,892

Grants. University rules for state aid to libraries were published in the following circular :

Grants from public library money

Apportionment of public library money. Such sum as shall have been appropriated by the legislature as public library money shall be paid annually by the treasurer, on the warrant of the comptroller, from the income of the United States deposit fund, according to an apportionment to be made for the benefit of free libraries by the regents in accordance with their rules and authenticated by their seal; provided that none of this money shall be spent for books except those approved or selected

and furnished by the regents; that no locality shall share in the apportionment unless it shall raise and use for the same purpose not less than an equal amount from taxation or other local sources; that for any part of the apportionment not payable directly to the library trustees the regents shall file with the comptroller proper vouchers showing that it has been spent in accordance with law exclusively for books for free libraries or for proper expenses incurred for their benefit; and that books paid for by the state shall be subject to return to the regents whenever the library shall neglect or refuse to conform to the ordinances under which it secured them.—*Laws of 1892, ch. 378 § 50*

Public library grants. Under the conditions prescribed by law, any library in the University or registered by the University, maintaining the required standard and free to the public for circulation, may receive annually as much from the public library money as it received in 1892 from the district library money, and in other cases not exceeding \$200. But if free for reference only, it may receive not more than half the amount raised from local sources for the same purpose.—*Regents ordinance 34*

The attention of libraries applying for state aid is called to the following points covered by the University law and regents rules:

1 *Basis of application.* 'The equivalent from local sources must be in money not in books; but by permission, half the actual present value, as fixed by the regents, may be allowed for books given for this purpose within one year.' Library trustees must therefore, as a rule, have the money still on hand when they apply.

A list of books given for the purpose may be sent to the public libraries division with a request for appraisal and premission to use them as a basis of application. After examination a certificate will be furnished stating the appraised value and the amount to which the library is thereby entitled. This certificate must be attached to the application.

2 *Time of application.* Library trustees may apply for public money at any time in the year. If all conditions are met and the state appropriation is available the grant will usually be made on the first of the following month. If the library has already received \$200 during the current fiscal year beginning October 1, the grant can not be made till the following October.

3 *Reports required.* 'No institution shall receive any grant from the regents till all the reports required of it have been submitted and accepted.' This applies to the annual library report as well as to the report of money sent.

4 *Use of money.* The money granted and the local equivalent must be spent for approved books, serials and bindings, unless otherwise used by special written permission. It can not be used for repairs or rebinding worn books.

5 *Report of expenditures.* After the money has been spent, the items of expenditure must be reported to the regents with the author, title and cost of each book bought, the name and cost of each periodical; and, when binding is charged, the authors, titles and cost of binding, with items of any other library expenses included in the account. Blank sheets for this return will be furnished and the note of transmittal must be signed by both the president of the trustees and the librarian.

6 *Books disapproved.* Books may be disapproved for various reasons. Some are unsuited for general library use on account of bad print, care-

less proof-reading, inferior paper, poor binding or paper covers; some on account of their too scholarly or technical character or great cost. Some are ill-adapted to a special community. Others are partizan in their tone, or superseded by later and more reliable works.

Many that have considerable popularity may be called 'weak' books. They are neither bad nor good, are without literary merit, use questionable English, present false or exaggerated views of life, and can easily be replaced by books that are equally attractive, have a positive character, give more useful information and are in better taste. Without disregarding the needs of children or the preferences of uncultivated readers, or the importance of inducing people to acquire the reading habit, many trivial books and series commonly found in popular libraries might well be omitted. It certainly would be wrong to increase their number at the expense of the state. Only the better class therefore will be approved.

If a positively immoral book is found on the shelves of a public library it must be removed as a condition of state aid. Books that are 'weak' may remain, if the trustees wish, but such can not be bought with the public money, or with the equal amount raised to secure the public money.

The regents will issue from time to time lists of approved books from which selections may be made. Such lists have appeared in regents bulletins and circulars, in traveling library and subject library lists, and in the American library association catalog of 5,000 volumes exhibited at the world's fair, Chicago, in 1893.

If a library wishes to secure approval of books before buying, a proposed list may be submitted to the regents office at any time.

7 *Sectarian books.* 'No books of a technically religious or controversial character can be bought with the state grant and the equal amount raised from local sources.' This prohibition includes sectarian books, books of evangelistic appeal and ecclesiastical propaganda, but not books of information fairly stated.

8 *Newspapers, public documents, traveling libraries.* None of the public money or the local equivalent can be spent for general newspapers; for periodicals unless of recognized value and kept as permanent additions to the library; for public documents originally issued by state or national governments without cost; or for paying the fee for a traveling library which is itself a gift from the state.

9 *Special library expenses.* Libraries wishing, in special circumstances connected with starting or reorganization, to use part of the public money or the local equivalent for bookcases, cataloguing, printing, library supplies or librarian's services must make an itemized request, stating the reasons, and obtain written permission in advance. This permit must be attached to the final report of items of expenditure when submitted for approval.

The public library fund is very much limited for so large a state and not only the laws and ordinances but the necessities of the case demand the most careful observance of the rules governing its use. Exceptions can not be made in favor of individual libraries, but all must conform to the same rules; otherwise what would be to the advantage of one would be an injury and so an injustice to the others.

MELVIL DEWEY
Director

Eight grants of \$13,746.44 to 91 libraries made in October, November and December, 1895, and January, February, March, April and May, 1896, exhausted the money available for subsidies. Of the remaining 29 applications 27 aggregating \$3942.15 were approved but filed unpaid till the next fiscal year. If these could have been paid within the year, the total grants would have been \$17,688.59 to 118 libraries; an increase of 32 libraries and \$3189.56 over the preceding year. The average payment was \$151 to each library as compared with \$168, \$167, and \$158 in preceding years. The amount sufficient in 1893 when 40 libraries were in a position to claim state aid was quite insufficient in 1896 when 118 libraries asked and 154 libraries were entitled to ask for this recognition of public service.

No one familiar with existing library conditions as compared with those of four years ago can fail to be impressed with multiplying signs of progress throughout the state. The number of free libraries has increased from 238 in 1893 to 351 in 1896. Their resources increased by 186,100 volumes during the last year. Their circulation was 2,293,861 in 1893; it advanced to 3,933,623 in 1896. Their average daily circulation was 10,777 volumes in 1896 as compared with 6285 in 1893. It advanced at the rate of 2157 a day during the last year. No small part of this remarkable increase is due to the substantial encouragement given by the state. The expenditure of the public money for books has been carefully guarded. Every dollar granted means another dollar raised from local sources. The long list of books reported are closely scrutinized by the book board of the state library. The work of libraries receiving aid is under constant inspection and improvement is seen on every hand. Many thousands of books now in constant use among the people would not have been supplied except for the bounty of the state.

Nov. 21, 1895 the regents voted as follows in regard to sectarian books.

Partizan books disallowed. Voted, That in approving the purchase of books for libraries admitted to the University, the book board be instructed to allow no expenditure of state money for any book of a technically religious or controversial character.

At the same meeting the following action was taken.

Specialized reference libraries. Applications for public library money having been received from a number of scientific and technical libraries in Buffalo, New York, and elsewhere, which are free to the public for reference but not for circulation,

Voted, That grants of public library money may be made under the rules to a public reference library specially devoted to pedagogy, history, genealogy, science, engineering, law, medicine, music, fine arts or other technical subject of interest to a considerable portion of the population in its immediate vicinity.

The following table shows the grants of public library money for the year:

Libraries receiving grants during year ending Sept. 30, 1896

1 Albany free library.....	\$ 200	33 Glens Falls, Crandall free library.....	\$200
2 Albany, Y. M. C. A. lib.	200	34 Havana free library....	50
3 Alexandria Bay, Hol- land library.....	200	35 Haverstraw, King's daughters pub. library	200
4 Alfred university library	200	36 Herkimer free library..	200
5 Angelica library ass'n..	200	37 Hunter public library..	84
6 Bath Beach, New Ut- recht free library....	200	38 Jamestown, James Pren- dergast library.....	200
7 Bath-on-Hudson, North Greenbush dist. no. 6 public library.....	50	39 Jordanville public lib...	55
8 Bay Ridge free library.	200	40 Keene Valley public lib.	50
9 Belmont lit. and hist. society free library...	100	41 Lake George free library	45
10 Boonville, Erwin library and institute.....	200	42 Liberty public library..	25
11 Buffalo, Grosvenor pub- lic library.....	200	43 Lockport public library	200
12 Buffalo library.....	100	44 Long Island City public library	200
13 Buffalo univ. med. dep't library	200	45 Madalin, Tivoli pub. lib.	52 54
14 Buffalo, Women's edu- cational and industrial union library.....	50	46 Malone, Wadham's read- ing circle.....	200
15 Buffalo, Y. M. C. A. lib.	200	47 Marathon, Peck memor- ial library.....	150
16 Camden library ass'n..	103 05	48 Mellenville public lib...	36
17 Canaan public library..	25	49 Nanuet public library..	50
18 Canton free library....	200	50 Nassau free library....	75
19 Catskill public library.	200	51 New York, Aguilar free library	400
20 Claverack free lib. and reading room ass'n....	74 94	52 New York, Bryson lib., Teachers college.....	200
21 Cornwall public library	25	53 New York, East side house, Webster lib...	200
22 Dansville public library	175	54 New York, Riverside association library...	200
23 Dryden, Southworth lib.	200	55 New York, St Agnes free library	200
24 East Chatham pub. lib.	75	56 New York, Y. W. C. A. library	200
25 Fairport public library	100	57 Newfield public library	20
26 Flushing library ass'n..	100	58 Niagara Falls pub. lib.	200
27 Fort Hamilton free lib.	100	59 North Tonawanda pub. library	200
28 Fredonia, D. R. Barker free library.....	200	60 Nyack library.....	200
29 Freeport public library	200	61 Ogdensburg pub. lib...	200
30 Gilbertsville free library	100	62 Oneonta public library.	200
31 Glen Cove public library	200	63 Oswego, State normal school library.....	200
32 Glen Haven public lib..	120		

Libraries receiving grants, etc. (continued)

64 Penn Yan public library	\$125	78 Springfield free library.	\$50
65 Philmont public library	57 27	79 Springville public lib.	200
66 Pleasantville lib. ass'n	140	80 Syracuse central library	734 89
67 Port Henry, Sherman free library.....	200	81 Tonawanda public lib..	200
68 Port Jervis free library	200	82 Troy children's neigh- borhood library.....	50
69 Port Washington free library	100	83 Troy, Y. W. A. library.	50
70 Rockville Center public library	50	84 Van Etten public lib...	83 25
71 Rome, Jervis lib. ass'n.	200	85 Vernon public library..	128
72 Rondout, Ponckhoekie public library.....	50	86 Waterloo library and historical society....	100
73 Salem, Bancroft public library	200	87 Watkins free public lib.	200
74 Saugerties public lib....	200	88 Waverly high school lib.	200
75 Schenectady free public library	200	89 Westbury, Greenwood public library.....	13
76 Sidney public library...	200	90 Westport library ass'n.	25
77 Sing Sing public library	200	91 Yonkers, Women's insti- tute library.....	200
			\$13,476 44

Summary statement of public libraries division for years 1891-96,
ending Sept. 30

	1891	1892	1893	1894	1895	1896	Deduct duplicates	Total
Visits of library in- spection.....			55	62	115	134		
Libraries chartered	1	1	25	27	23	24	4	97
Libraries admitted			2	6	10	3		21
Libraries registered				1	20	15		36
Unregistered char- ter						1		1
Libraries under in- spection.....	1	1	27	34	53	43	4	155
Library transfers approved.....			20	14	18	15		67
Libraries receiving public library money			40	62	86	91		161
Money granted.....			\$6,341.74	\$10,351.92	\$14,399.03	\$13,746.44		\$44,839.13
Books granted.....				\$200	\$100			\$300

TRAVELING LIBRARIES

As the system of traveling libraries becomes better known the applications increase and the books have never been in such great demand as at present. The appropriation for the year becoming exhausted in May several libraries were delayed, and in a few collections for special study, some desirable books could not be supplied for lack of funds. Letters of appreciation continue to be received both from within and without the state.

Samples of our blanks, lists of books and detailed accounts of our system have been sent to individuals and clubs in Maine, New Jersey, Pennsylvania, Georgia, Ohio, Indiana and Iowa to aid efforts now being made to introduce the New York system of traveling libraries into these states.

Libraries in working order have been exhibited at a public meeting of the Public education association in New York, at which an address was given by Sec. Melvil Dewey; at a meeting in the interests of traveling libraries held at the free public library of Newark, N. J.; at the spring meeting of the N. Y. library association held at Syracuse, N. Y.; at the annual meeting of the National educational association, in connection with the organization of the library committee of the association; and at the annual meeting of the American library association held at Cleveland, O. Samples of our book cases have also been sent to John Thomson of the Philadelphia library co. who has established in connection with his library a traveling library system for Philadelphia and the immediate vicinity; and to Miss L. E. Herron, librarian of Hampton institute, Va., from which small libraries are to be sent out to graduates of the institute, who are teaching in the negro schools of the south.

The Ohio state library commission, in commencing a traveling library system has reprinted for its own use some of our application blanks and rules for lending. The action taken in Iowa is outlined on p. 153 of this report.

Volumes. The total number of volumes accessioned in the public libraries division, Oct. 1, 1897 was 27,027. Of these 204 have been sold, 9 damaged, 10 worn out and 143 lost. 75 of the lost books belonged to the capitol library and to the collection used for lending to institutions in the University.

The volumes now in use are distributed as follows:

General libraries

No. 1	100 v.	5 sets contain	500 v.
2	100 "	5 "	500 "
3	100 "	4 "	400 "
4	100 "	2 "	200 "
5	100 "	4 "	400 "
6	100 "	4 "	400 "
7	100 "	5 "	500 "
8	100 "	2 "	200 "
9	100 "	2 "	200 "
10	100 "	7 "	700 "
11	50 "	9 "	450 "
12	50 "	9 "	450 "
13	50 "	10 "	500 "
14	50 "	10 "	500 "
15	50 "	10 "	500 "
16	102 "	10 "	1,020 "
17	50 "	5 "	250 "
18	50 "	5 "	250 "
19	25 "	8 "	200 "
20	25 "	9 "	225 "
21	50 "	5 "	250 "
22	25 "	9 "	225 "
23	25 "	9 "	225 "
24	50 "	5 "	250 "
25	50 "	5 "	250 "
26	25 "	11 "	275 "
27	50 "	5 "	250 "
28	25 "	1 "	25 "

175 sets contain

10,095 v.

Subject libraries

Economics	subj. no. 330	25 v.	5 sets contain	125 v.
"	" " 330	50 "	3 "	150 "
Agriculture	" " 630	33 "	5 "	165 "
"	" " 630	60 "	5 "	300 "
Literature	" " 800	58 "	10 "	580 "
Amer. literature	" " 820	26 "	5 "	130 "
French history	" " 944	45 "	5 "	225 "
U. S. history	" " 973	20 "	5 "	100 "
"	" " 973	26 "	5 "	130 "
"	" " 973	46 "	6 "	276 "

54 sets contain

2,181 v.

Capitol library	2,330 v.
Sold, etc.	366 "
For extension purposes	10,211 "
" lending to institutions in the University	1,844 "

Total 27,027 v.

Additions. Since Oct. 1, 1895, 6162 volumes have been bought for three additional sets each of 20, 22, and 23; 11 sets of a new young people's library, no. 26; five sets of no. 27 (50 vols.); one set of no. 28 (young people's); also five sets of 26 volumes covering the regents U. S. history reading courses. This number also includes books for lending to institutions in the University, for the capitol library and for special

subject libraries made up for groups of students at registered university extension centers and study clubs.

The following table will show how the various collections of the traveling libraries section have been built up.

Distribution	1893-98	1893-94	1894-95	1895-96	Total
Capitol lib.....	240	1,072	658	360	2,330
b S books.....		824	876	144	1,844
c Trav. lib.....	4,432	5,017	2,056	1,196	12,701
Extension.....	a 1,274	1,262	8,154	4,462	10,152
	5,846	8,175	6,744	6,162	27,027

The books bought for the traveling libraries were distributed as shown in the following table.

1st yr			2d yr			3d yr			4th yr		
no.			no.			no.			no.		
1	100v.	5 sets	11	50v.	10 sets	16	102v	5 sets	19	25v.	3 sets
2	" "	5 "	12	" "	10 "	19	25"	5 "	20	25v.	3 "
3	" "	5 "	13	" "	10 "	20	" "	5 "	22	" "	3 "
4	" "	2 "	14	" "	10 "	21	50"	5 "	23	" "	3 "
5	" "	5 "	15	" "	10 "	22	25"	6 "	26	" "	11 "
6	" "	5 "	16	102"	5 "	23	" "	6 "	27	50"	5 "
7	" "	5 "	17	50"	5 "	24	50"	5 "	28	25"	1 "
8	" "	2 "	18	" "	5 "	25	" "	5 "	973	26"	5 "
9	" "	2 "	800	59"	10 "	944	45"	2 "			
10	" "	8 "	820	29"	5 "						
330	25"	5 "	944	45"	3 "						
330	50"	5 "									
630	33"	5 "									
630	60"	5 "									
973	20"	5 "									
973	48"	6 "									
75 sets			83 sets			44 sets			34 sets		

Total 236 sets

Use. During the year 253 traveling libraries have been lent.

118	were sent to	43	public libraries
84	"	44	groups of taxpayers
18	"	12	extension centers
26	"	16	borrowers under special permit
7	"	5	places for exhibition

258 were sent to 120 places

a Of these 438 were bought by the extension department before Oct. 1, 1898.

b Books marked S are placed on the state library shelves and are used for lending to institutions in the University.

c Includes only the general and special subject libraries, each of which contains a fixed collection of books which are numbered and catalogued and may not be separated from each other.

These issues were made as follows :

133 libraries were used once for	133 issues
57 " twice for	114 "
2 " three times for	6 "
192 libraries were used for	253 issues

A summary of the kind and number of traveling libraries sent out since Oct. 1, 1892, follows.

APPLICATION	1st yr	2d yr	3d yr	4th yr	Total
Trustees	14	69	74	119	276
Tax payers	9	47	61	87	204
Extension	23	19	59	139	240
Borrowers .....	....	4	18	26	48
	46	139	212	371	768

Of 11,152 volumes sent out and returned during the past year, the total circulation was 34,890 of which 22,237 was fiction. The readers were 6109, an average of about 4 books to each reader.

These facts refer only to the general subject and traveling libraries. Of 4958 volumes sent out and returned on extension applications the reported circulation was 4304 and the reported number of readers 744 ; an average of 6 books to a reader. These figures however are much too small, for only 44 out of the 69 libraries returned reported the circulation and number of readers. This failure to report arises in most cases from the fact that the books are used largely for reference, and are also passed from one member of the club to another, without charging to each individual, to save time in the preparation of papers.

A comparative view of the circulation of books is given below :

	1st yr	2d yr	3d yr	4th yr	Total
Traveling libraries	6,470	23,836	22,845	34,890	88,041
Capitol library	793	5,300	9,420	6,845	22,358
	7,263	29,136	32,265	41,735	110,399

**Traveling libraries (not including extension) sent Oct. 1, 1895—Sept.
30, 1896**

Free libraries		25 taxpayers		Extension centers, etc.		Borrowers	
Albany	7 lbs.	Aurora		Blauvelt		Albany	
Amsterdam	3 "	Bedford Park	6 lbs.	Bolivar	2 lbs.	Buffalo	2 lbs.
Andover	3 "	Bedford Station	2 "	Buffalo	4 "	"	2 "
Ballston Spa	3 "	Buffalo		Chautauqua	3 "	"	2 "
Bath Beach	3 "	Burnt Hills		Cuba		"	2 "
Bath-on-Hudson	2 "	Calro	2 "	Herkimer		Canaan 4 Cor.	2 "
Belmont	2 "	Cayuga	2 "	Jamestown		Canandaigua	
Caldwell		Charlton	2 "	New Brighton		Hotel Champl'n	
Camden		Chestertown		Point of Woods		Honeoye Falls	
Canajoharie	3 "	Copake	3 "	Troy		Lake Placid	3 "
Canandaigua	4 "	Coventry	2 "	"		Lake View	
Castile	3 "	East Durham		Worcester		New York	
Ellenville	7 "	Esperance				Olean	3 "
Far Rockaway	4 "	Floral Park				Saratoga	
Fort Plain	6 "	Freehold				S. West Oswego	
Fultonville		Gansevoort	2 "			Unadilla	2 "
Greenville		Harkness					
Jamestown	2 "	Java				16	
Lansingburg	3 "	Lansingburg	3 "				
Mc Grawville	2 "	Louisville	3 "				
Madison		Luzerne	2 "				
Mellenville		Mariboro	3 "				
Middleburg		Medusa					
Morristown	3 "	Minaville					
Nassau	2 "	Morrisville					
Norwood	4 "	Northport	4 "				
Ogdensburg	3 "	Northville	3 "				
Palatine Bridge		Oakwood	2 "				
Penn Yan	5 "	Palenville	2 "				
Pocantico Hills	6 "	Peru	2 "				
Rome		Piermont	3 "				
St Johnsville	2 "	Pine Bush					
Sea Cliff	3 "	Prince's Bay	3 "				
Sherburne	4 "	Rensselaerville					
Sherman	2 "	Queens					
Spencer		Riga					
Tarrytown	6 "	Scriba					
Ticonderoga	2 "	Sloansville	2 "				
Tomkins Cove	2 "	South Berlin	4 "				
Van Etten		South Westerlo					
Waterville	3 "	Vernon	2 "				
Westport	2 "	Vischer's Ferry					
Windsor		Wales Center	2 "				
		Westhampton	3 "				
43		44		12			
						On exhibition	
						Summary	
						Free libraries	
						25 taxpayers	
						Exten. centers, etc.	
						Borrowers	
						On exhibition	
						Total	
						43	
						44	
						12	
						16	
						5	
						120	

Traveling libraries sent Oct. 1, 1895—Sept. 30, 1896

Lib. no.	PLACE	Sent	Returned	Form of application	No. of readers	CIRCULATION		Average books per reader	Highest circulation of 1 book
						Total	Fiction		
1	McGrawville.....	10 Ja 96	27 Ag 96	Trus....	.....	411	268	.....	23
1a	Coventry.....	8 D 96	29 Je 96	Pet.....	57	332	230	5.6	16
1b	Floral Park.....	21 Ja 96	28 S 96	Pet.....	35	154	96	4.4	9
1c	Greenville.....	7 D 96	12 Je 96	Trus....	.....	385	162	.....	12
1e	Palenville.....	5 Ag 96	.....	Pet.....	.....	.....	.....	.....	.....
1d	Esperance.....	20 N 96	31 Ag 96	Pet.....	50	328	184	6.5	11
					142	1,600	915	11.3	
2	Riga.....	6 N 96	13 Je 96	Pet.....	16	105	59	6.5	7
2b	Freehold.....	7 N 96	15 My 96	Pet.....	.....	103	42	.....	5
2c	Mellenville.....	9 D 96	8 Je 96	Trus....	22	67	39	8	5
2d	Bedford Park.....	26 Mr 96	.....	Pet.....	.....	.....	.....	.....	.....
					38	275	140	7.2	
3	Cayuga.....	1 Je 96	16 D 96	Pet.....	92	344	192	4.1	14
3b	East Durham.....	6 D 96	19 Je 96	Pet.....	58	319	164	5.5	18
3b	Java.....	25 S 96	.....	Pet.....	.....	.....	.....	.....	.....
3c	Andover.....	1 O 96	27 Ag 96	Trus....	76	248	163	3.2	21
3d	Morrisonville.....	6 F 96	23 O 96	Pet.....	46	216	144	4.7	12
					272	1,127	663	4.1	
4	Amsterdam.....	8 Ja 96	7 Ag 96	Trus....	.....	227	141	.....	.....
4a	Camden.....	5 F 96	29 Ag 96	Trus....	51	137	89	2.7	8
					51	364	233	7.1	
5a	Belmont.....	28 D 96	27 Ag 96	Trus....	.....	264	117	.....	13
5b	Middleburg.....	17 D 96	.....	Trus....	.....	.....	.....	.....	.....
5c	Aurora.....	6 Ja 96	15 Je 96	Pet.....	.....	339	156	.....	16
5d	South Westerlo.....	16 O 96	4 Je 96	Pet.....	49	202	99	4.1	14
					49	795	372	17.2	
6a	Copake.....	10 D 96	19 Je 96	Pet.....	41	188	71	4.6	8
6b	Prince's Bay.....	10 D 96	16 Je 96	Pet.....	62	292	119	4.2	13
6c	Canandaigua.....	17 D 96	1 Jl 96	Trus....	.....	502	178	.....	17
6d	Rome.....	13 Ja 96	28 S 96	Trus....	44	158	90	3.6	8
					147	1,110	458	7.6	
7	Minaville.....	27 Mr 96	17 O 96	Pet.....	39	296	179	7.5	.....
7a	Caldwell.....	24 Mr 96	22 O 96	Trus....	31	58	40	1.8	.....
7b	Canandaigua.....	11 Ja 96	1 Jl 96	Bor.....	.....	331	158	.....	12
7c	Bedford Park.....	26 Mr 96	.....	Pet.....	.....	.....	.....	.....	.....
7d	Castile.....	21 Ja 96	9 D 96	Trus....	.....	309	115	.....	19
					70	394	492	12.8	
8	Palatine Bridge.....	3 Mr 96	4 S 96	Trus....	34	91	51	2.7	5
8	Rensselaerville.....	5 S 96	.....	Pet.....	.....	.....	.....	.....	.....
8a	Pine Bush.....	15 F 96	26 O 96	Pet.....	107	684	315	6.3	21
					141	775	366	5.5	
9	Albany.....	17 Ap 96	21 O 96	Trus....	70	157	75	2.2	12
9a	Saratoga Springs.....	2 Je 96	18 O 96	Bor.....	.....	.....	.....	.....	.....
					70	157	75	2.2	
10a	Lake View.....	27 My 96	6 O 96	Bor.....	.....	.....	.....	.....	.....
10b	South West Oswego.....	23 N 96	10 N 96	Bor.....	.....	82	52	.....	5
10c	Vischer's Ferry.....	9 N 96	26 My 96	Pet.....	50	280	135	5.6	13
10c	Spencer.....	18 S 96	.....	Trus....	.....	.....	.....	.....	.....
10d	Medusa.....	18 Ja 96	1 S 96	Pet.....	34	209	122	6	8
10e	Honeoye Falls.....	9 N 96	18 Je 96	Bor.....	18	96	65	5.3	7
10f	Ganesevoort.....	7 O 96	13 Ap 96	Pet.....	89	616	353	6.9	22
10f	Buffalo.....	8 Jl 96	17 Jl 96	a	.....	.....	.....	.....	.....
10g	Albany.....	10 O 96	8 Ap 96	Trus....	102	273	173	2.6	15
10g	Hotel Champlain.....	11 Jl 96	16 O 96	Bor.....	92	206	100	2.2	10
					385	1,763	1,010	4.6	

a On exhibition

Traveling libraries sent Oct. 1, 1895—Sept. 30, 1896 (continued)

Lib. no.	PLACE	Sent	Returned	Form of application	No. of readers	CIRCULATION		Average books per reader	Highest circulation of 1 book
						Total	Fiction		
11	Northport	26 My 96	2 N 96	Pet	38	88	55	2.3	9
11a	Oakwood	9 D 95	16 Je 96	Pet	44	247	114	5.6	12
11b	Marlboro	27 Ap 96	11 N 96	Pet	39	95	48	2.5	7
11c	Bedford Park	26 Mr 96	.....	Pet .....	.....	.....	.....	.....	.....
11f	Morristown	6 F 96	16 S 96	Trus	57	106	51	1.9	9
11h	South Berlin	5 F 96	9 O 96	Pet .....	.....	48	25	.....	4
11i	Albany	10 O 95	8 Ap 96	Trus	69	118	65	1.6	11
11i	Prince's Bay	16 Je 96	5 Ja 97	Pet	49	140	88	2.8	10
					296	841	446	2.8	
19c	Amsterdam	8 Ja 96	7 Ag 96	Trus .....	.....	206	142	.....	21
19c	Pocantico Hills	21 Ag 96	.....	Trus .....	.....	.....	.....	.....	.....
12d	Prince's Bay	16 Je 96	5 Ja 97	Pet	49	175	121	3.5	15
12e	Nassau	31 F 96	13 O 96	Trus .....	.....	167	97	.....	13
12f	Northport	26 My 96	2 D 96	Pet	49	118	83	2.4	11
12h	Albany	17 Ap 96	21 O 96	Trus	54	113	89	2.1	13
12i	Norwood	28 Ja 96	10 S 96	Trus	41	144	92	3.5	12
					193	925	624	4.8	.....
13	Tarrytown	14 D 95	16 J1 96	Trus .....	.....	95	42	.....	6
13a	Nassau	21 F 96	13 O 96	Trus .....	.....	186	91	.....	15
13b	Northport	26 My 96	2 D 96	Pet	49	92	46	1.9	6
13e	Newark, N. J.	29 Ja 96	6 F 96	Pet .....	.....	.....	.....	.....	.....
13e	New York	5 Mr 96	8 Mr 96	a .....	.....	.....	.....	.....	.....
13e	Bedford Park	26 Mr 96	.....	Pet .....	.....	.....	.....	.....	.....
13f	Luzerne	28 Ag 96	.....	Pet .....	.....	.....	.....	.....	.....
13h	Albany	11 F 96	25 S 96	Bor .....	.....	13	2	.....	2
					49	386	181	7.9	.....
14	Buffalo	25 Mr 96	19 O 96	Bor .....	.....	.....	.....	.....	.....
14a	Wales Center	2 Ja 96	27 Ag 96	Pet .....	.....	114	47	.....	7
14b	Northport	26 My 96	2 D 96	Pet	55	114	75	2	10
14c	Canaan Four Cor.	31 J1 96	23 S 96	Bor .....	.....	.....	.....	.....	.....
14d	Peru	7 Mr 96	23 O 96	Pet .....	.....	185	88	.....	11
14f	Unadilla	22 J1 96	1 F 97	Bor .....	.....	59	34	.....	6
14h	Fort Plain	11 My 96	27 N 96	Trus	84	173	98	2	12
14i	Tomkins Cove	2 N 95	3 Je 96	Trus .....	.....	84	50	.....	7
					139	729	387	5.2	.....
15	Sea Cliff	2 Mr 96	6 O 96	Trus	71	182	129	2.5	17
15a	Tomkins Cove	2 N 95	3 Je 96	Trus .....	.....	90	59	.....	8
15a	Canaan 4 Cor.	31 J1 96	23 S 96	Bor .....	.....	.....	.....	.....	.....
15b	Bedford Park	26 Mr 96	.....	Pet .....	.....	.....	.....	.....	.....
15d	Olean	10 Ap 96	31 D 96	Bor .....	.....	85	64	.....	13
15e	Westport	16 J1 96	.....	Trus .....	.....	.....	.....	.....	.....
15f	Unadilla	22 J1 96	1 F 97	Bor .....	.....	41	39	.....	6
15g	Marlboro	27 Ap 96	11 N 96	Pet	40	115	71	2.8	8
15h	Luzerne	28 Ag 96	.....	Pet .....	.....	.....	.....	.....	.....
15i	Peru	7 Mr 96	23 O 96	Pet .....	.....	129	69	.....	9
					111	642	421	5.8	.....
16	Sloansville	22 O 95	1 My 96	Pet .....	.....	665	485	.....	20
16	Northville	15 My 96	5 D 96	Pet	77	320	218	4.1	13
16a	Canajoharie	15 F 96	15 J1 96	Trus	59	141	138	2.3	8
16a	Copake	11 S 96	.....	Pet .....	.....	.....	.....	.....	.....
16b	Cayuga	14 O 95	16 My 96	Pet	142	1,026	688	7.2	24
16b	Point of Woods	29 Je 96	1 O 96	E	82	140	122	2.2	6
16c	Chestertown	31 O 95	24 Je 96	Pet	95	640	470	6.7	16
16c	Louisville	6 Ag 96	.....	Pet .....	.....	.....	.....	.....	.....
16d	Bedford Station	2 Ap 96	14 O 96	Pet .....	.....	149	138	.....	9
16e	Marlboro	11 O 95	24 Ap 96	Pet	62	458	339	7.4	16
16e	Gansevoort	2 My 96	17 N 96	Pet	73	467	353	6.4	16
16f	Harkness	11 O 95	15 Ap 96	Pet	46	234	189	5	12
16f	New York	21 Ap 96	29 O 96	Bor .....	.....	173	132	.....	6

a On exhibition

Traveling libraries sent Oct 1, 1895 — Sept. 30, 1896 (continued)

Lib. no.	PLACE	Sent	Returned	Form of application	No. of readers	CIRCULATION		Average books per reader	Highest circulation of 1 book
						Total	Fiction		
16g	Windsor	13 Mr 96	25 N 96	Trus .....	.....	424	305	.....	17
16h	Madison	14 O 95	30 Ap 96	Trus	64	422	308	6.6	17
16h	Sherburne	12 My 96	7 D 96	Trus	88	316	231	3.8	18
16i	Queens	16 Mr 96	5 O 96	Pet	78	538	397	7.3	16
					836	6,123	4,507	7.3	.....
17	Bath Beach	6 F 96	29 Ag 96	Trus .....	.....	187	145	.....	17
17	Bolivar	25 S 96	.....	E .....	.....	.....	.....	.....	.....
17a	Fort Plain	11 O 95	11 My 96	Trus	78	179	119	2.2	15
17a	Buffalo	12 My 96	7 D 96	Bor .....	.....	83	66	.....	8
17b	Worcester	26 N 95	12 Je 96	E	95	127	90	5	12
17b	Canajoharie	16 JI 96	.....	Trus .....	.....	.....	.....	.....	.....
17c	Buffalo	9 N 95	2 N 96	Bor	7	14	9	.....	3
17d	Lansingburg	21 Ja 96	17 JI 96	Pet	66	191	122	2.9	13
17d	Tarrytown	18 JI 96	26 Ja 97	Trus .....	.....	188	79	.....	11
					176	919	630	5.2	.....
18	Buffalo	25 Mr 96	19 O 96	Bor .....	.....	.....	.....	.....	.....
18a	Oakwood	9 D 95	16 Je 96	Pet	43	225	126	5.4	11
18a	Westhampton	10 JI 96	1 F 97	Pet .....	.....	89	46	.....	7
18b	Fort Plain	7 O 95	11 My 96	Trus	84	177	96	2.1	11
18b	Canandaigua	17 JI 96	4 Ja 97	Trus .....	.....	220	150	.....	15
18c	Pocantico Hills	29 O 95	28 JI 96	Trus .....	.....	69	50	.....	6
18d	Bath-on-Hudson	7 Ja 96	3 S 96	Trus	36	79	29	2.2	10
					163	869	497	5.3	.....
19	Waterville	12 D 95	22 My 96	Trus .....	.....	116	91	.....	10
19	Pocantico Hills	21 Ag 96	.....	Trus .....	.....	.....	.....	.....	.....
19a	Sherburne	19 O 95	6 My 96	Trus	71	233	163	3.2	19
19a	Penn Yan	15 Je 96	16 Ja 97	Trus	106	339	265	3.2	26
19b	Bath Beach	6 F 96	29 Ag 96	Trus .....	.....	133	101	.....	15
19b	Buffalo	10 S 96	.....	E .....	.....	.....	.....	.....	.....
19c	Westhampton	10 JI 96	1 F 97	Pet .....	.....	104	80	.....	14
19d	Fort Plain	11 My 96	27 N 96	Trus	60	137	97	2.2	11
19e	Ellenville	17 Ja 96	23 Ag 96	Trus	51	296	227	5.8	23
19e	Norwood	11 S 96	.....	Trus .....	.....	.....	.....	.....	.....
19f	Morristown	6 F 96	16 S 96	Trus	62	142	108	2.3	17
19f	Ballston Spa	16 S 96	.....	Trus .....	.....	.....	.....	.....	.....
19g	Far Rockaway	15 F 96	23 Je 96	Trus	60	157	108	2.6	11
19g	Tarrytown	18 JI 96	26 Ja 97	Trus .....	.....	155	124	.....	19
					409	1,812	1,364	4.4	.....
20	Penn Yan	11 D 95	15 Je 96	Trus	118	293	234	2.4	19
20	Westhampton	10 JI 96	1 F 97	Pet .....	.....	66	54	.....	9
20b	Olean	10 Ap 96	31 D 96	Bor .....	.....	28	26	.....	4
20c	Pocantico Hills	29 O 95	28 JI 96	Trus .....	.....	57	45	.....	6
20c	Norwood	11 S 96	.....	Trus .....	.....	.....	.....	.....	.....
20d	Sherburne	19 O 95	6 My 96	Trus	86	269	204	3	18
20d	Northville	15 My 96	5 D 96	Pet	42	104	83	2.4	12
20e	Ellenville	17 Ja 96	28 Ag 96	Trus	54	387	281	6.2	29
20e	Buffalo	10 S 96	.....	E .....	.....	.....	.....	.....	.....
20f	Far Rockaway	15 F 96	23 Je 96	Trus	55	155	111	2.8	13
20f	Ballston Spa	16 S 96	.....	Trus .....	.....	.....	.....	.....	.....
20g	Bath Beach	6 F 96	29 Ag 96	Trus .....	.....	177	134	.....	16
20h	Chautauqua	7 JI 96	21 S 96	E .....	.....	.....	.....	.....	.....
					355	1,476	1,172	4.2	.....
21	Ellenville	10 Ja 96	3 S 96	Trus	160	478	260	2.9	24
21a	Sherburne	19 O 95	6 My 96	Trus	87	274	171	3.1	23
21a	Tarrytown	18 JI 96	26 Ja 97	Trus .....	.....	225	145	.....	16
21b	Charlton	29 O 95	13 My 96	Pet	63	250	168	3.9	15
21b	Lake Placid	23 Je 96	19 O 96	Bor .....	.....	35	22	.....	5
21c	Waterville	2 N 95	22 My 96	Trus .....	.....	216	128	.....	13
21c	Canajoharie	16 JI 96	.....	Trus .....	.....	.....	.....	.....	.....
21d	Albany	10 O 95	8 Ap 96	Trus	110	205	142	1.8	13
21d	Buffalo	12 My 96	7 D 96	Bor	52	152	107	2.9	14
					472	1,735	1,143	3.7	.....

Traveling libraries sent Oct. 1, 1895—Sept. 30, 1896 (continued)

Lib. no.	PLACE	Sent	Returned	Form of application	No. readers	CIRCULATION		Average books per reader	Highest circulation of 1 book
						Total	Fiction		
22	McGrawville	7 F 96	27 Ag 96	Trus....	.....	267	206	.....	21
22a	Waterville	2 N 95	22 My 96	Trus....	.....	180	140	.....	15
22b	Louisville	6 Ag 96	.....	Pet.....	.....	.....	.....	.....	.....
22b	Wales Center	2 Ja 96	27 Ag 96	Pet.....	.....	66	52	.....	8
22b	Vernon	11 S 96	.....	Pet.....	.....	.....	.....	.....	.....
22c	Coventry	6 D 95	29 Je 96	Pet.....	47	174	146	8.7	16
22c	Buffalo	10 S 96	.....	E.....	.....	102	79	.....	9
22d	Castile	21 Ja 96	9 D 96	Trus....	.....	102	79	.....	9
22d	Lansingburg	21 Ja 96	17 Ji 96	Pet.....	64	225	175	3.5	15
22e	Pocantico Hills	21 Ag 96	.....	Trus....	.....	.....	.....	.....	.....
22f	Far Rockaway	15 F 96	23 Je 96	Trus....	55	162	109	2.9	13
22f	Palenville	5 Ag 96	.....	Pet.....	.....	.....	.....	.....	.....
22g	Ogdensburg	26 F 96	29 O 96	Trus....	.....	231	276	.....	25
22h	Chautauqua	7 Ji 96	24 S 96	E.....	.....	.....	.....	.....	.....
					166	1,527	1,183	9.2	.....
23	Pocantico Hills	29 O 95	28 Ji 96	Trus....	.....	62	52	.....	7
23	Buffalo	10 S 96	.....	E.....	.....	.....	.....	.....	.....
23a	Piermont	13 Mr 96	10 O 96	Pet.....	.....	92	72	.....	8
23b	Albany	17 Ap 96	21 O 96	Trus....	33	62	53	1.9	9
23c	Sloansville	22 O 95	1 My 96	Pet.....	.....	239	176	.....	17
23c	Northville	15 My 96	5 D 96	Pet.....	48	111	95	2.3	11
23d	Andover	1 O 95	27 Ag 96	Trus....	90	373	273	4.1	23
23e	South Berlin	5 F 96	9 O 96	Pet.....	.....	68	58	.....	6
23f	Far Rockaway	15 F 96	23 Je 96	Trus....	55	178	131	3.2	11
23g	Syracuse	26 My 96	8 Je 96	a.....	.....	.....	.....	.....	.....
23g	Penn Yan	15 Je 96	16 Ja 97	Trus....	106	290	247	2.8	17
					332	1,484	1,156	4.5	.....
24	Cleveland, O.	26 Ag 96	15 S 96	a.....	.....	.....	.....	.....	.....
24	Ballston Spa	16 S 96	.....	Trus....	.....	.....	.....	.....	.....
24a	Charlton	29 O 95	13 My 96	Pet.....	55	216	160	3.9	15
24a	Syracuse	26 My 96	15 Je 96	a.....	.....	.....	.....	.....	.....
24a	Penn Yan	15 Je 96	16 Ja 97	Trus....	142	364	275	2.7	25
24b	Piermont	13 Mr 96	10 O 96	Pet.....	.....	106	88	.....	10
24c	Ellenville	17 Ja 96	8 S 96	Trus....	138	411	250	3.1	25
24d	Ogdensburg	26 F 96	29 O 96	Trus....	.....	306	191	.....	20
					330	1,493	964	4.5	.....
25	Bedford Park	28 O 95	26 Mr 96	Pet.....	34	69	50	2	11
25	Buffalo	27 Mr 96	14 O 96	Bor....	.....	.....	.....	.....	.....
25a	Penn Yan	11 D 95	15 Je 96	Trus....	132	279	151	2.1	16
25a	Westport	16 Ji 96	.....	Trus....	.....	.....	.....	.....	.....
25b	Jamestown	28 O 95	2 Je 96	Trus....	.....	588	306	.....	25
25b	Lake Placid	23 Je 96	19 O 96	Bor....	.....	44	23	.....	4
25c	Tarrytown	14 D 95	16 Ji 96	Trus....	.....	135	88	.....	12
25c	Canandaigua	17 Ji 96	4 Ja 97	Trus....	.....	254	149	.....	27
25d	Lansingburg	7 Ja 96	4 S 96	Trus....	51	219	121	4.1	12
25d	Ellenville	8 S 96	.....	Trus....	.....	.....	.....	.....	.....
					217	1,583	885	7.3	.....
26	Tarrytown	14 D 95	16 Ji 96	Trus....	.....	143	116	.....	12
26	Canandaigua	17 Ji 96	4 Ja 97	Trus....	.....	290	216	.....	21
26a	Buffalo	27 D 95	7 Ag 96	Pet.....	40	182	130	4.5	13
26a	Cleveland, O.	26 Ag 96	15 S 96	a.....	.....	.....	.....	.....	.....
26b	Belmont	28 D 95	27 Ag 96	Trus....	.....	234	177	.....	20
26b	Copake	11 S 96	.....	Pet.....	.....	.....	.....	.....	.....
26c	Ogdensburg	26 F 96	29 O 96	Trus....	.....	406	297	.....	28
26d	Amsterdam	8 Ja 96	7 Ag 96	Trus....	.....	266	220	.....	20
26d	Vernon	11 S 96	.....	Pet.....	.....	.....	.....	.....	.....
26e	Piermont	13 Mr 96	10 O 96	Pet.....	.....	89	63	.....	8
26f	Sea Cliff	24 Mr 96	6 O 96	Trus....	42	146	110	3.4	14
26g	Bedford Station	2 Ap 96	14 O 96	Pet.....	.....	61	49	.....	5
26h	Albany	17 Ap 96	21 O 96	Trus....	56	89	72	1.6	10
26i	Fort Plain	11 My 96	27 N 96	Trus....	79	170	125	2.1	14
26j	Lake Placid	7 Ji 96	19 O 96	Bor....	.....	82	28	.....	6
					217	2,108	1,598	9.7	.....

a On exhibition

Traveling libraries sent Oct. 1, 1895—Sept. 30, 1896 (concluded)

Lib no.	PLACE	Sent	Returned	Form of appli- cation	No. of readers	CIRCULATION		Average books per reader	Highest circu- lation of 1 book
						Total	Fiction		
27	Olean	10 Ap 95	31 D 95	Bor.		142	111		19
27a	Bath-on-Hudson...	27 F 95	3 S 95	Trus.	49	107	47	2.2	9
27a	Ellenville	8 S 95		Trus.					
27b	Buffalo	27 Mr 95	14 O 95	Bor.					
27c	Sea Cliff	2 Mr 95	6 O 95	Trus.	57	179	126	3.1	17
27d	Burnt Hills	8 Mr 95	17 S 95	Pet.	15	120	71	8	10
27d	Jamestown	17 S 95		Trus.					
					121	548	355	4.5	
28	Chautauqua	24 Jl 95	24 S 95	E.					
280j	Buffalo	4 N 95	2 N 95	Bor.	3	8		2.6	2
280b	Sherman	12 My 95		Trus.					
280p	Lansingburg	7 Ja 95	4 S 95	Trus.	8	5		1.6	2
280s	Van Etten	1 Ag 95		Trus.					
					6	13		2.2	
680i	Troy	18 Je 95		E.					
680i	Louisville	6 Ag 95		Pet.					
680o	Castile	21 Ja 95	22 D 95	Trus.		48			3
680p	South Berlin	5 F 95	9 O 95	Pet.		5			2
680q	Morristown	6 F 95	16 S 95	Trus.	8	15		2	2
					8	68		8.5	
800i	Andover	4 N 95	19 Je 95	Trus.	37	164		4.4	10
800m	Ticonderoga	16 Ap 95		Trus.					
800n1	Cairo	9 Ap 95		Pet.					
800n3	Scriba	29 N 95	18 Je 95	Pet.	22	80		2.5	6
800n4	St Johnsville	1 N 95		Trus.					
					69	244		3.6	
830r	Bolivar	25 S 95		E.					
944j	Herkimer	28 O 95	6 My 95	E.	16	53		3.3	4
944l	Cuba	23 N 95	12 Je 95	E.		24			4
					16	37		5	8
973i	Blauvelt	26 O 95	15 My 95	E.	18	76		4.2	8
973j	Jamestown	2 N 95	2 Je 95	E.		112			13
973k	Troy	23 N 95	12 Ag 95	E.					
973m	Fultonville	9 D 95	15 Jl 95	Trus.		26			3
973n	Fort Plain	5 O 95	18 Ap 95	Trus.		15			5
973o	New Brighton	28 Ja 95	6 Ag 95	E.					
973p	Lansingburg	21 Ja 95	17 Jl 95	Pet.	17	24		1.9	6
974q	Cairo	9 Ap 95		Pet.					
973r	South Berlin	5 F 95	9 O 95	Pet.		5			1
973s	Norwood	28 Ja 95		Trus.					
					35	258		7.4	
973o	Ticonderoga	16 Ap 95		Trus.					
973p	Lansingburg	7 Ja 95	4 S 95	Trus.	28	71		2.4	7
973q	St Johnsville	7 Ja 95		Trus.					
973r	Sherman	12 My 95		Trus.					
973s	Ellenville	17 F 95	15 O 95	Trus.		89			8
					28	160		5.7	

Summary of use of traveling libraries from Oct. 1, 1895—Sept. 30, 1896

GENERAL LIBRARIES

Lib. no.	Sets	Sent	Ret'd	CIRCULATION					Readers
				Least	Largest	Average	Total	Fiction	
1.....	5	6	5	154	411	320	1,600	915	142
2.....	5	4	3	67	105	92	275	140	38
3.....	4	5	4	216	344	282	1,127	663	272
4.....	2	2	2	137	227	182	364	233	51
5.....	4	4	3	202	339	265	795	372	49
6.....	4	4	4	158	502	279	1,110	458	147
7.....	5	5	4	58	331	224	894	492	70
8.....	2	3	2	91	684	338	775	366	141
9.....	2	2	2	157	157	157	157	75	70
10.....	7	10	9	82	616	196	1,763	1,010	385
11.....	9	8	7	48	247	120	841	446	296
12.....	9	7	6	113	208	154	925	624	193
13.....	10	8	6	13	186	65	386	181	49
14.....	10	8	8	59	185	91	729	387	139
15.....	10	10	7	41	182	92	642	421	111
16.....	10	17	15	140	1,026	408	6,123	4,507	836
17.....	5	9	7	14	191	131	919	630	176
18.....	5	7	7	69	220	124	869	497	163
19.....	8	14	10	104	339	181	1,812	1,364	409
20.....	9	13	10	28	337	148	1,476	1,172	355
21.....	5	9	8	35	478	217	1,735	1,143	472
22.....	9	14	9	66	351	169	1,527	1,183	166
23.....	9	11	10	62	373	148	1,484	1,156	332
24.....	5	8	7	106	411	213	1,493	964	330
25.....	5	10	8	44	583	198	1,583	885	217
26.....	11	15	13	32	406	192	2,108	1,598	217
27.....	5	7	5	107	179	110	548	355	121
28.....	1	1	.....	.....	.....	.....	.....	.....	.....
Total..	175	221	181	.....	.....	.....	34,060	22,237	5,947

SUBJECT LIBRARIES

Lib. no.	Vol.	Sets	Sent	Ret'd	CIRCULATION				Readers
					Least	Largest	Average	Total	
Economics									
330.....	50	3	1	1	.....	8	.....	8	3
330.....	25	5	3	1	.....	5	.....	5	3
Agriculture									
630.....	60	5	2	.....	.....	.....	.....	.....	.....
630.....	33	5	3	3	5	48	23	68	8
Literature									
800.....	58	10	5	2	80	164	122	244	69
American literature									
820.....	26	5	1	.....	.....	.....	.....	.....	.....
French history									
944.....	45	5	2	2	34	53	44	87	16
U. S. history									
973.....	46	6	5	5	15	112	46	229	18
973.....	20	5	5	3	5	24	10	29	17
973.....	26	5	5	2	71	89	80	160	28
Total.....	.....	49	32	19	.....	.....	.....	830	162
General total of trav. libs.....		224	253	200	.....	.....	.....	34,890	6,109

Capitol library. During the year ending Oct. 1, 1896, 241 borrowers have been added to the capitol library register, making a total of 668 of whom 345 are still entitled to draw books.

Borrowers from the state library, even when not state employees, may take one volume at a time from the capitol library. During the past year 719 of these loans have been made. They are included in the tables of capitol library statistics.

By vote of the regents, May 1, 1895, all special borrowers' permits for the state library were recalled and permits issued after that date were limited to specified subjects. Miscellaneous fiction is never allowed. This restriction together with the lack of funds for buying new books has reduced the circulation and number of readers.

Summary of use of capitol library, Oct. 1895 - 30 Sept. 1896

General	Philosophy	Religion	Sociology	Philology	Science	Useful arts	Fine arts	Literature	History	Total
109	14	23	144	2	59	33	91	5476	894	6845

Percentage of each subject read, Oct. 1895 - 30 Sept. 1896

General	Philosophy	Religion	Sociology	Philology	Science	Useful arts	Fine arts	Literature	History
.01+02+	.....	.....	.....	.01+	.8	.13

Extension library. Registered centers and clubs continue to apply for books for special study, and much appreciation is expressed. The appropriation for this work became exhausted in May, causing some embarrassment both to the office and to the clubs. The following tables will show the places to which these libraries were sent, and the subjects covered.

Summary of use of extension books, Oct. 1, 1895—Sept. 30, 1896

PLACE	Borrowing body	Subject	Vols.	Sent	Returned	Readers	Circulation
Albany	Club	English literature	103	4 O 95	27 My 96	9	64
	Center	History and criticism of painting	14	24 F 96	28 Ap 96		
Albion	Club	History	102	7 O 95	28 Je 96	27	99
	"	India	104	24 S 96			
Attica	"	English literature	102	11 D 95	28 Ag 96	36	145
Aurora	"	Germany	50	4 Mr 96	11 S 96	8	26
	"	England	50	26 S 96			
Belmont	"	Holland	50	1 S 96			
Binghamton	"	German literature	25	10 Mr 96	12 Ag 96		
	"	Shakspeare	25	20 F 96	25 S 96		
Bolivar	"	History of England	25	25 S 96			
Buffalo	"	Egypt	100	28 O 95	6 My 96	74	319
	"	Russia	100	28 S 96			
	"	Architecture and sculpture	50	23 Ja 96	8 Ap 96		
	"	Education	100	11 O 95	23 Je 96	31	173
	"	Sculpture	100	28 O 95	6 Ag 96		
	"	Greece	25	16 Ap 96			
	"	Child-study	50	23 Ja 96	3 D 96		
	"	Architecture	76	28 Jl 96			
	"	Greece	101	3 S 96			
	Center	English literature	185	29 F 96	27 N 96		
	"	Civil and religious liberty	113	30 O 95	16 Mr 96		77
	"	English literature	109	5 F 96	6 Ag 96		29
Cassatota	Club	American history and literature	52	2 S 96			
Canisteo	"	Roman history	25	17 S 96			
Carthage	"	Shakspeare	25	20 D 95	17 Jl 96		
	"	"	25	17 S 96			
Catskill	"	Spain	51	23 O 95	12 Je 96	18	80
Central Valley	"	American history and literature	100	25 S 96			
Chariton	"	English literature	104	13 N 95	12 My 96	18	298
Chautauqua	Sum sch	General	340	7 Jl 96	14 S 96		
Danville	Club	Shakspeare	25	21 My 96			
Dunkirk	"	Historic questions	55	25 O 95	29 Je 96	21	60
	"	English literature	50	20 Ag 96			
	"	Italy and Rome	100	28 Ag 96			
East Randolph	"	Greek and Roman history	100	19 N 95	1 Je 96	16	108
Fayetteville	"	Holland	50	18 O 95	19 Je 96	8	96
	"	French literature	25	16 S 96			
Fredonia	"	Art and Shakspeare	109	2 O 95	15 Ap 96	92	302
	"	" and dramatic literature	90	25 S 96			
Fulton	"	Shakspeare and Germany	50	26 O 95	15 My 96		
Geneseo	"	German literature	25	24 S 96			
Geneva	"	Germany	59	18 D 95	8 Ja 97	21	113
Glens Falls	"	Grecian and Italian art	25	6 Mr 96			
Greenwich	"	Colonial history	25	12 My 96			
Groton	"	Syria	25	18 O 95	12 Ag 96	20	108
	"	Greece	108	2 S 96			
Hamilton	"	Victorian era	50	23 N 95	12 Ag 96	20	65
	"	Early England	75	3 S 96			
Haverstraw	"	Italy	30	8 S 96			
Jamestown	"	Colonial history	60	2 N 95	2 Je 96		
Johnstown	"	Sixteenth century	50	31 O 95	24 Je 96	19	47
	"	History, etc.	49	26 S 96			
Kingston	Center	Social economics	54	16 D 95	13 Ap 96		22
Littlefalls	Club	Colonial history	65	28 O 95	1 Je 96		
Lockport	"	Irish history	100	14 N 95	15 Je 96		
Lowville	Center	General	100	28 Mr 96			
Mansona	Club	English literature	100	4 O 95	16 Je 96	21	83
Mansona center	"	American history	100	25 S 96			
Middletown	"	France and Italy	51	12 D 95	16 Jl 96		126
	"	Holland	46	29 Ja 96	7 Jl 96		
	"	Egypt	58	4 S 96			
Mt Vernon	Center	Shakspeare	19	16 O 95	20 F 96		
	"	Chemistry	50	9 Ja 96	12 Ag 96		73
New Brighton	Club	American history and literature	80	28 Ja 96	6 Ag 96	26	84

Summary of use of extension books, Oct. 1, 1895—Sept. 30, 1896 (*concluded*)

PLACE	Borrowing body	Subject	Vols.	Sent	Returned	Readers	Circulation
New York.....	Club....	Constitutional history	51	10 Ja 96	.....	.....	.....
Nyack.....	".....	Dante and Shakspeare	50	5 D 95	19 Je 96	17	113
Ogdensburg.....	".....	England	100	26 N 95	17 JI 96	.....	77
	".....	"	47	9 S 96	.....	.....	.....
	".....	British empire	85	16 S 96	.....	.....	.....
Olean.....	".....	Egypt	59	27 Ja 96	2 Ja 97	.....	70
	".....	Greece	51	17 S 96	.....	.....	.....
Oxford.....	".....	English literature	101	9 O 95	12 Ag 96	16	268
Plattsburg.....	Sum. sch	General	117	2 JI 96	7 O 96	70	95
Potsdam.....	".....	French history	29	5 Ag 96	.....	.....	.....
Rochester.....	".....	Jewish history	50	26 O 95	12 Ag 96	.....	63
Salamanca.....	".....	French history	26	3 O 95	24 Ap 96	16	23
	".....	American literature	50	2 S 96	.....	.....	.....
	".....	French history	50	21 O 95	.....	.....	.....
Salem.....	Center..	American literature	153	25 Ja 96	14 My 96	.....	78
Saratoga.....	Club.....	French history	50	2 N 95	2 Je 96	.....	.....
	".....	Italy	50	25 S 96	.....	.....	.....
	Center..	America and Europe in 18th century	101	9 Ja 96	17 Je 96	.....	.....
Schenectady.....	Club.....	Italy	50	13 N 95	19 My 96	29	71
Schuylerville.....	".....	English authors	26	16 Mr 96	25 N 96	11	42
Silver Creek.....	".....	American constitution	50	6 D 95	16 Je 96	13	45
King Sing.....	Center..	English literature	77	10 O 95	12 My 96	.....	.....
Syracuse.....	Club.....	Julius Caesar	104	19 O 95	6 My 96	.....	.....
	".....	Shakspeare	50	7 D 95	23 Je 96	23	44
	".....	French history and Shakspeare	52	6 D 95	3 Je 96	.....	.....
	".....	France	50	17 S 96	.....	.....	.....
Tarrytown.....	Center..	Italian history	57	22 N 95	7 My 96	.....	.....
Troy.....	Club.....	Ancient history and Amer. statesmen	54	23 N 95	12 Ag 96	.....	.....
	".....	Italy	25	7 D 95	30 JI 96	12	33
Utica.....	Center..	Electricity	23	24 O 95	24 Ja 96	27	120
	Club.....	Amer. government	101	6 Mr 96	4 D 96	17	54
Warsaw.....	".....	French history	100	12 O 95	22 My 96	8	140
	".....	England	101	26 S 96	.....	.....	.....
Watertown.....	".....	"	50	26 O 95	25 S 96	.....	33
	".....	English literature	100	27 Mr 96	.....	.....	.....
	".....	Architecture and art.	100	23 O 95	9 JI 96	.....	131
	".....	Painting	59	17 S 96	.....	.....	.....
Waterville.....	".....	Travel in Gt Britain	25	21 Ja 96	12 Ag 96	.....	39
	".....	History of Rome	25	8 N 95	14 My 96	.....	.....
	".....	Roman history	54	2 S 96	.....	.....	.....
	".....	English literature	23	17 S 96	.....	.....	.....
W. New Bright'n	".....	Spain	25	6 D 95	10 S 96	.....	60
Westfield.....	".....	Germany	100	23 JI 96	.....	.....	.....
White Plains	Center..	English language	102	12 N 95	28 O 96	.....	67
Yonkers.....	".....	Geology	19	13 D 95	14 Ap 96	.....	.....
	".....	English literature	39	18 F 96	8 Je 96	.....	.....
	".....	European history	51	5 S 96	.....	.....	.....
			7,539			744	4,304

Extension books lent on other applications

PLACE	Borrowing body	Subject	Vols.
Albany.....	Albany boys' club.....	General.....	100
".....	Albany county wheelmen.....	".....	51
".....	Albany girls' club.....	".....	50
".....	Young men's association.....	".....	50
Albion.....	Public library.....	Holland.....	25
Buffalo.....	Falconwood company.....	Best books of 1895.....	52
".....	Highland park club.....	Juvenile.....	26
Cairo.....	25 taxpayers.....	General.....	23
Hoosick Falls.....	St Mary's academy.....	U. S. history.....	25
Lake Placid.....	Summer hotel.....	General.....	75
Oxford.....	Academy.....	".....	133
Sing Sing.....	Public library.....	English literature.....	101
Ticonderoga.....	Union school.....	General.....	25
Total.....			736

GENERAL LIBRARY INTERESTS

Local subsidies. 15 libraries maintained by private corporations for public use and registered by the University received certificates of approved circulation on which to base their applications for local subsidies as follows :

Certificates of circulation given to free libraries

No.	Name of library	Certified circulation for one year vols.
1	Albany free library.....	6,000
2	Auburn, Seymour library association.....	9,535
3	Bay Ridge free library.....	12,000
4	Easton library association.....	500
5	Fort Hamilton free library.....	7,000
6	Fort Plain free library.....	5,000
7	Gloversville free library.....	60,000
8	Havana free library.....	4,000
9	New York, Aguilar free library.....	315,000
10	" New York free circulating library.....	680,000
11	" St Agnes free library.....	30,000
12	" Webster free library.....	18,500
13	" Y. W. C. A. library.....	60,000
14	Nyack library.....	21,000
15	Rome, Jervis library association.....	13,000
Total.....		1,241,535

Advice and assistance. The correspondence of the division shows a constant growth of interest in library matters, not only among the people of our own state, but in many other states from which come frequent

requests for information and advice based upon the experience of New York. There has been a special desire to obtain reports of the working of the traveling library system. Among our own libraries an increasing number have applied for temporary assistance in rearranging and cataloguing their books and, to a limited extent, trained cataloguers have been employed for a few weeks on the recommendation of the division. In special circumstances and by regents permission a part of the public money granted to the libraries has been used by them in paying for such work and for library supplies.

The importance of good library methods is more and more widely recognized with the result of a marked advance in the kind of work accomplished.

Best books of 1895. In January 1896 a list of 306 leading books of 1895 was printed and sent to 800 librarians of New York and other states to obtain an expression of opinion respecting the best 50 books of that year for a village library. The books were arranged in class order with author, title, publisher and price. From 139 lists returned a summary was printed with the same books arranged in order of their popularity. This summary was again revised and a somewhat different result obtained, as explained below, and published as follows:

BEST BOOKS OF 1895 FOR A VILLAGE LIBRARY

Made up by combining the votes of 15 librarians selected as expert judges of books ; revised by M. S. Cutler after consultation with J. N. Larned, and accepted at the Syracuse meeting of the New York state library association, May 30, 1896

BOOKS OF REFERENCE

Leypoldt, Mrs A. H. and Iles, George. List of books for girls and women and their clubs.

Willsey, J. H. comp. Harper's book of facts.

RELIGION

Balfour, A. J. Foundations of belief.

Alden's Study of death and Leroy Beaulieu's Israel among the nations are suggested as alternates for a small library where it is thought Balfour would not find readers.

SOCIAL SCIENCE

Brooks, Noah. How the republic is governed.

Shaw, Albert. Municipal government in continental Europe.

——— Municipal government in Great Britain.

Mr Larned would omit Shaw's books for a small library and put in Useful arts, Mason's Origins of invention, and Shaler's Domesticated animals.

Wright, C. D. Industrial evolution of the United States. (Chautauqua)

EDUCATION

Martin, G. H. Evolution of the Massachusetts public-school system. (Internat. educ. ser.)

Wiggin, Mrs K. D. and Smith, N. A. Froebel's gifts. (The republic of childhood, v. 1)

FOLK-LORE AND FAIRY TALES

Harris, J. C. Mr Rabbit at home.

Lang, Andrew. My own fairy book.

NATURAL SCIENCE

Clodd, Edward. Story of primitive man. (Lib. of useful stories)

Lowell, Percival. Mars.

Scudder, S. H. Frail children of the air.

Wright, M. O. Birdcraft.

USEFUL ARTS

Atkinson, Philip. Electricity for everybody.

See note under Social science.

MUSIC

Guerber, H. A. Stories of the Wagner operas.

AMUSEMENTS AND SPORTS

Porter, L. H. Cycling for health and pleasure.

FICTION

Barlow. Strangers at Lisconnel.

Burnham, Mrs C. L. The wise woman.

Clemens, S. L. Tragedy of Pudd'nhead Wilson.

Coffin, C. C. Daughters of the revolution and their times.

Crawford, F. M. The Ralstons. 2 v.

Davis, R. H. Princess Aline.

Grahame, Kenneth. The golden age.

Jewett, S. O. Life of Nancy.

Maartens, Maarten, *pseud.* My lady Nobody.

Maclaren, Ian, *pseud.* Days of auld lang syne.

Parker, Gilbert. When Valmond came to Pontiac.

Smith, F. H. Gentleman vagabond and some others.

Stockton, F. R. Adventures of Captain Horn.

Ward, Mrs E. S. P. A singular life.

Weyman, S. J. From the memoirs of a minister of France.

——— Red cockade.

Wiggin, Mrs K. D. Village watch-tower.

Zangwill, Israel. The master.

JUVENILE

Brown, H. D. Little Miss Phoebe Gay.

Henty, G. A. Knight of the white cross. Or

——— Through Russian snows. Or

——— Tiger of Mysore.

- Kipling, Rudyard. Second jungle book.
 Lang, Andrew. Red true story-book.
 Munroe, Kirk. At war with Pontiac.
 Thaxter, *Mrs* Celia. Stories and poems for children.

POETRY

- Stedman, E. C. Victorian anthology, 1837-1895.

OTHER LITERATURE

- Van Dyke, Henry. Little rivers.

DESCRIPTION AND TRAVEL

- Bourget, Paul. Outre-mer.
 Davis, R. H. About Paris
 Hapgood, I. F. Russian rambles.
 King, Grace. New Orleans, the place and the people.
 Norman, Henry. Peoples and politics of the far East.
 Ralph, Julian. Dixie.
 Remington, Frederick. Pony tracks.
 Stevenson, R. L. Amateur emigrant from the Clyde to Sandy Hook.
 Vincent, Frank. Actual Africa.

BIOGRAPHY

- Arnold, Matthew. Letters of Matthew Arnold, 1848-1888. 2 v.
 Sherman, John. Recollections of 40 years in the house, senate and cabinet. 2 v.
 Stevenson, R. L. Vailima letters. 2 v.

EUROPEAN HISTORY

- Baird, H. M. Huguenots and the revocation of the edict of Nantes. 2 v.
 Greene, F. D. Armenian crisis in Turkey.
 New edition under title 'The rule of the Turk,' should be bought now.
 Latimer, *Mrs* E. W. Europe in Africa in the 19th century.

AMERICAN HISTORY

- Grinnell, G. B. Story of the Indian. (Story of the West ser.)
 Lodge, H. C. and Roosevelt, Theodore. Hero tales from American history.
 Walker, F. A. Making of the nation, 1783-1817. (American hist. ser.)

Library legislation. The municipal law of 1892 provided for the establishment of a public library by a municipality on petition of a majority of its taxpayers and under other confusing and difficult conditions. This provision was repealed in 1896 and superseded by the simple enactment that any municipal corporation may establish and maintain a free public library in accordance with the library provisions of the University law.

The insanity law of 1896 contained a provision that libraries may be furnished to any state hospital, at the expense of the institution, by the regents of the University subject to regulations adopted by them and the commission in lunacy.

Library legislation in other states. Ohio established a public library commission of three appointed by the governor with the consent of the senate to serve two, four and six years, their successors to serve six years, to have control of the state library and the distribution of state publications, and to advise any free public library on request. The state librarian is secretary of the commission.

Iowa enacted a law authorizing any public, incorporated, school or college library to become 'associate' with the state library on compliance with rules of the state library trustees, reporting annually to the state librarian and entitled to borrow books or collections of books, at borrower's expense, and to receive advice on any desired library subject. Where no such library exists 25 resident taxpayers may organize and obtain like privileges under trustees rules. \$4000 was appropriated for Iowa traveling libraries.

In the same state another act authorized taxation in cities to the extent of three mills on a dollar to meet interest on debts incurred for public library buildings and to create a sinking fund for payment of such debt. By another act any city under special charter may use park land for a public library site.

In New Jersey, in cities of other than the first class a tax of not more than two mills on a dollar may be levied for enlarging or changing a public library building.

Utah has adopted a public library act. By vote of its council any city of the first or second class may establish and maintain a free public library. On petition of 1000 voters and property taxpayers in cities of the second class, the council may levy annually a tax for this purpose of not more than one third of a mill on a dollar.

The mayor with approval of the city council shall appoint nine library directors for terms of one, two and three years, and annually thereafter shall appoint three directors to serve three years. They shall report annually to the city council.

In any city of the third class or any town, on petition of 50 legal voters, a vote shall be taken on the question of a stated rate of annual taxation for public library maintenance, not to exceed one mill on a dollar. At the same election there may be six library directors elected for two, four and six years, and biennially thereafter two directors shall be elected to serve six years.

New York library association and New York library club.

At a joint meeting held in New York city, Jan. 10, 1896 the subjects discussed were,

The library as a city missionary

Settlement libraries

Home and club libraries

Parish libraries

Librarians at the Atlanta exposition

New library building of the Pratt institute

The state and the public library

Maintaining the public library

By endowment

By taxation

How to start a library movement

The following officers of the New York library association were elected to serve one year :

J. N. Larned, Buffalo, *president*

C. A. Nelson, New York

M. . E. Hazeltine, Jamestown } *vice-presidents*

W: R. Eastman, Albany, *secretary*

J. N. Wing, New York, *treasurer*

More than 100 persons were present at the business sessions and at the dinner given in the evening by the New York library club.

A report of the meeting is in the *Library journal* for January 1896.

The New York library association also met at Syracuse, May 29-30, 1896 with the Syracuse central library. Papers and addresses were presented on

The library situation in central New York

How we started our library movement

A library association or a public library

Reading as a factor in education

Ways of advertising a library

Opportunity of the librarian to influence the reading of the community

The value of a library to a rural community and how to secure it

The vote on the best books of 1895 was discussed and revised, and the list given above in this report was accepted. The attendance was considerably larger than the previous year, reaching about 100 at the evening session. Full reports of the meeting appeared in the *Library journal* for June 1896, and in *Public libraries* for July 1896.

The New York library club held five meetings during the year as follows :

Nov. 14, 1895 at Mercantile library, New York. Reports on the Denver conference of the American library association. Reports on the new work undertaken during the past year, new methods, etc.

Jan. 10, 1896. Joint meeting with the N. Y. L. A.

Feb. 20, 1896 at Grolier club, New York. Paper on Printing by T. L. De Vinne and one on Book-plates by Miss Louise Both-Hendriksen.

March 19, 1896 at Bruce memorial library, New York. Paper by R. R. Bowker on Libraries and library problems in greater New York followed by discussion. Discussion on Bookbinding.

May 14, 1896 at the library of the Young women's Christian association, New York. Paper by C. A. Nelson on the formation and 10 years' work of the club.

The following officers were elected :

Mary W. Plummer, Brooklyn, *president*

A. E. Bostwick, New York, *first vice-president*

W. J. C. Berry, New York, *second vice-president*

Josephine A. Rathbone, Brooklyn, *secretary*

Elizabeth Tuttle, Brooklyn, *treasurer*

Reports of all meetings appeared in the *Library journal*.

The American library association. At its 18th annual meeting at Cleveland, Ohio and Mackinaw, Mich., Sept. 1-8, 1896, the registered attendance was 359, the largest in the history of the association.

The address of the president, J. C. Dana dealt with 'The other side,' stating and answering objections to the public library. Mr J. N. Larned of Buffalo followed with a paper of great interest on Retrospect and prospect in the closing years of the century. The new building for the library of congress was described by its builder, Bernard R. Green. Other subjects considered were :

Public documents

Appraisals of literature and publishing of annotated lists

Traveling libraries

Relations of the librarian to his trustees

Relations of the bookseller to the librarian

Preparing books for issue and charging systems.

A notable feature of the meeting was an evening discussion of the merits and demerits of books in the list prepared for the supplement to the A. L. A. catalog.

The following officers were elected :

W. H. Brett, Cleveland, O.,	<i>president</i>	
H. L. Elmendorf, St Josephs, Mo.		} <i>vice-presidents</i>
J. K. Hosmer, Minneapolis, Minn.		
Hannah P. James, Wilkes-Barre, Penn.		
R. P. Hayes, Columbus, O.,	<i>secretary</i>	
G. W. Cole, Jersey City, N. J.,	<i>treasurer</i>	

Full accounts of the meeting appeared in the *Library journal* for September, 1896, and in *Public libraries* for October, 1896; the official report of proceedings with the papers presented was in the *Library journal* for December, 1896.

Library session of University convocation. One of the most interesting library events of the year was the session devoted to this subject at the last University convocation on Thursday morning, June 25, 1896, and reported in the published proceedings. J. N. Larned of the Buffalo library read a paper of marked interest on The mission and the missionaries of the book.

Papers were presented on the Correlation of library and school by A. L. Peck of the Gloversville free library and J. A. Estee, superintendent of the Gloversville schools; and one on How to develop interest in the library was read by W. E. Foster, librarian of the Providence (R. I.) public library. Miss M. E. Hazeltine of the James Prendergast free library in Jamestown opened the general discussion, followed by many others, the entire morning being occupied.

National educational association. This great national body which brings together at its annual meetings 10,000 to 20,000 teachers has shown its appreciation of the educating value of public libraries by establishing a library department. This action was taken at the meeting in Buffalo in July 1896. The department was at once organized by the election of Melvil Dewey of Albany, N. Y., president, J. H. Van Sickel of Denver, Col., vice-president and Miss M. E. Ahern, of Chicago, Ill., secretary.

Respectfully submitted

MELVIL DEWEY

Director

STATISTICS OF NEW YORK LIBRARIES 1896

Reports received. The summary of reports from 806 libraries of 300 volumes or more is given in the following tables.

This summary shows a gain of 84 libraries over the number reporting for 1895, but when all the material furnished by the libraries is used, a considerable number remain unaccounted for, making it not yet possible to report the full library resources of the state.

The active lending libraries are well represented and the comparative statistics of this class for the different years have a constantly increasing value.

Reports are arranged in the general table in alphabetic order of places. The relation of each library to the University, whether holding a University charter, admitted to or registered by the University, or the property of a teaching institution in the University is indicated in the sixth column of the general table. In the general summaries the number of reporting libraries 'in the University' and 'not in the University' are placed in parallel columns opposite their respective classes.

SUMMARIES

Date of founding

Reporting libraries founded previous to 1800	7
“ “ 1800-19	13
“ “ 1820-29	19
“ “ 1830-39	19
“ “ 1840-49	35
“ “ 1850-59	52
“ “ 1860-69	88
“ “ 1870-79	86
“ “ 1880-89	122
“ “ 1890-96, 6½ years	205
	<hr/>
No date reported.....	646
	<hr/>
Total	806

SUMMARIES

	Libraries in University	Libraries not in University	Total
Libraries reporting	612	194	806
Source of charter			
King George 3 of England	-----	1	1
Legislature	a 4	b 28	32
General law	17	22	39
Regents	90	-----	90
Belonging to University or chartered institution ..	502	75	577
Not chartered	-----	69	69
Relation to the University			
Department of the University	1	-----	1
Holding University charter	90	-----	90
Admitted to the University	19	-----	19
Belonging to University institutions	c 502	-----	502
Registered by the University	6	26	32
Not related to the University	-----	168	168
Class of books			
General	591	167	758
Law	3	10	13
Medical	7	8	15
Theological	4	2	6
Scientific	1	5	6
Historical	-----	1	1
Pedagogic	1	-----	1
Statistical	-----	2	2
Pharmaceutic	4	-----	4
Art	-----	1	1
Ownership or control			
Public school district	339	16	355
Public district	51	-----	51
Other public	11	4	15
Total public	400	21	421
Government	1	14	15
School	105	14	119
College	50	-----	50
Institutional	5	69	74
Endowed	14	11	25
Membership	36	60	96
Business	-----	1	1
Parish	-----	5	5
Private	-----	8	8
d Support			
Endowment or productive property	34	31	65
Taxation	396	25	421
State aid	450	46	496
General funds of the institution	194	138	332
U. S. Government	-----	2	2

a Wood library, Canandaigua, is entered under both legislature and regents.

b Gloverville free library is entered under both legislature and general law.

c Six libraries belonging to University institutions are also registered.

d Many libraries derive part of their support from each of several sources; many have not reported on support.

SUMMARIES (concluded)

	Libraries in University	Libraries not in University	Total
a Terms of use			
Free to public for reference	40	50	90
“ “ lending	302	49	351
“ limited class for lending	296	80	376
Subscription open to all	4	37	41
“ limited	1	7	8
Private .....	.....	3	3

	No. lbs.	VOLUMES		
		Added in 1 year	Total	Circulation
Libraries of 1000 vols. or more				
Free to public for lending	199	114,851	1,222,138	3,775,787
“ “ reference only	70	104,255	1,905,642	.....
College libraries (all)	50	65,188	1,072,303	.....
Law “	14	12,218	268,783	.....
Libraries of 10,000 vols. or more				
Free to public for lending	25	60,893	760,411	2,663,472
“ “ reference only	26	95,140	1,743,033	.....
Others	21	32,854	861,980	.....
Total	72	188,887	3,365,424	.....
University libraries	118	53,717	327,310	988,471

General comparative summary 1893-96

	1893	1894	1895	1896	Increase for one year
No. of libraries....	600	704	723	806	83
Volumes added.....	225,195	246,751	258,741	296,498	37,757
“ total	3,851,945	4,133,378	4,392,999	4,647,661	254,662
Circulation	3,136,602	3,619,178	4,156,744	5,008,402	851,658

a Some libraries free for reference are also free to a limited class for lending, and included under both heads.

b Including the circulation of subscription libraries and of those free to a limited class as well as those free to the public.

EXAMINATION OF TABLES

Date of founding. The date of establishment is reported by 646 libraries. Seven of these were founded previous to 1800 as follows:

Columbia university library 1754
 a New York society library 1754
 Montgomery union school library 1787
 Canandaigua academy library 1795
 Union college library 1795
 Lansingburg academy library 1796
 New York hospital library 1796

86 reporting libraries were founded in the half century from 1800 to 1849. In the four following decades, the numbers for each decade were 52, 88, 86 and 122 respectively; while 205 are reported for the last six and a half years, 1890 to 1896. For 160 libraries no date is given.

Source of charter. The New York society library reports that its charter was given by King George 3 of England in 1772. King's college, now Columbia university, was chartered by the king in 1754 but Columbia library, not holding an independent charter, appeared in this table as belonging to a University institution.

Of 32 libraries chartered by the legislature four are now in the University. Of 39 libraries incorporated under general laws, 17 are in the University; 90 hold regents charters, 502 libraries belong to as many teaching institutions in the University and 75 others belong to institutions not in the University, such as schools, clubs, hospitals and Christian associations. 69 reporting libraries are neither chartered nor under the care of any chartered bodies.

Growth. There is an increase over the reports of 1895 of 98 libraries in the University. 10 of these are public district libraries, three are public libraries and nine are membership libraries. There is a gain of 68 in the item of university libraries in the care of school authorities. The number of reporting libraries not in the University is smaller than the previous year by 15.

The number of libraries supported by taxation has increased from 337 to 421, and of those receiving state aid from 407 to 496, indicating a growing sense of public obligation to maintain public libraries.

The number of free lending libraries in the University has advanced from 250 to 302, while outside the University it fell from 59 to 49, show-

a. Founded as the public library in 1700.

ing a total increase from 309 to 351; a gain much larger than that of the previous year.

Grouping by themselves the free lending libraries having 1000 volumes or more, we find their number increased from 181 to 199. 114,851 books have been added during the year and their total circulation has increased from 3,012,000 to 3,775,787 volumes.

70 reference libraries of like size have added 104,255 volumes and 50 college libraries have added 63,188 volumes. There are now 1,905,642 books in the free reference libraries and 1,072,303 in the college libraries.

90,342 volumes were given to the libraries of the state and 206,156 were bought, showing a total addition of 296,498 as compared with 258,741 in 1895.

The total number of volumes reported is 4,647,661 of which 1,313,299 or a little more than one fourth are in the free lending libraries.

The total circulation of the year was 5,008,402 volumes, an increase of 851,658 over 1895. The increase for two previous years was 500,000 a year.

Other points relating to the increase of libraries are given in the special tables.

Geographic distribution of libraries and comparative circulation by counties. This table of free and other libraries in each county, with the number of volumes, compares the library returns with the population of the county as given in the census of 1892 and states the circulation of the free libraries in proportion to the population and to the volumes in the libraries, assigning to each county and to each group of counties its relative rank in the state.

The county of New York has more libraries and more volumes than any other, but in the proportion of volumes to population it is fifth in rank, coming after Tompkins, Albany, St Lawrence and Ontario. In the use of free libraries New York is first in volume of circulation, but eleventh in proportion to population and sixth in proportion to the books in those libraries. Fulton leading in relation to population and Clinton in relation to books. Tables are here given to show the 10 counties that stand first in the use of free libraries.

10 counties with largest free circulation in proportion to population

COUNTY	Population	Circulation of free libraries	Circulation per 1000 population
1 Fulton	38,478	70,473	1831
2 Oneida	123,756	195,167	1577
3 Herkimer	47,491	66,119	1392
4 Orange	97,760	127,819	1307
5 Warren	28,618	36,026	1259
6 Tompkins	33,612	44,550	1028
7 Chautauqua	78,900	77,154	978
8 Westchester	145,106	131,011	903
9 Montgomery	46,081	39,348	854
10 St Lawrence	26,542	22,411	844

Comparing this table with the corresponding record for 1895, we find Montgomery and St Lawrence for the first time among the 10 leading counties while New York and Tioga have fallen out though both gained on their record of last year. Fulton county retains its lead with an increased margin of difference, having gained in circulation from 1744 to 1831 per 1000 of population. Oneida county with a remarkable gain from 899 to 1577 advances from sixth to second place and Herkimer county, changing from 1140 to 1392 books per 1000 people, rises from fifth to third. The standard has materially changed in two years. The lowest record among the 10 counties was 603 per 1000 in 1894, 734 in 1895 and 844 in 1896.

The following summary shows two years gain in number of counties reaching a given standard of circulation in proportion to population.

Summary of counties circulating 1000 and 500 volumes for each 1000 population, 1894-96

	NUMBER OF COUNTIES		
	1894	1895	1896
Circulating 1000 or more volumes per 1000 population..	3	5	6
" 500 " " "	14	20	27

10 counties with largest free circulation in proportion to volumes

COUNTY	Volumes in free libraries	Circulation of free libraries	Circulation per 100 volumes
1 Clinton	1618	10,063	622
2 Kings	103,531	489,362	473
3 Montgomery	8507	39,348	463
4 Schenectady	3905	17,692	453
5 Saratoga	9429	41,117	436
6 New York	350,920	1,516,711	432
7 Warren	8525	36,026	423
8 Ulster	7857	32,478	413
9 Broome	11,799	48,349	410
10 Rockland	7120	27,522	387

Comparing this table with that of the first 10 counties in 1895, we find that Montgomery, Schenectady and Saratoga appear for the first time, while Greene, Otsego and Fulton have fallen out. Clinton remains first with an average circulation of 622 per 100 volumes, as against 516 in 1895. Kings, changing from 433 to 473, has advanced from fifth to second place. New York, rising from 403 to 432, and Warren, from 371 to 423, have each gone forward one place and the others have fallen back a little. In this comparison, also, the standard of the first 10 counties has advanced. The minimum of their circulation was 293 per 100 in 1894, 336 in 1895 and 387 in 1896.

The following table compares the number of counties circulating a given number of volumes for each 100 for three years.

Summary of counties circulating 600 to 200 volumes for each 100, 1894-96

	NO. OF COUNTIES		
	1894	1895	1896
Circulating 600 or more vols. for each 100.....	-----	-----	1
" 500 " " 	1	1	1
" 400 " " 	4	7	9
" 300 " " 	8	13	17
" 200 " " 	23	24	31

Comparative summary of free and other libraries. The comparative summary for the entire state for the last four years shows a constant increase each year in every item noted; but the gain of the last year is greater than that of any other. The volumes in all the libraries are now 713 for each 1000 of the population. The free libraries

number 351 and the free circulation shows a marked increase. Counting seven days in the week, the average circulation of books is 10,777 a day, an increase of 2,157 a day the past year. The average circulation for each 1000 persons has advanced from 352 in 1893 to 604 in 1896.

The proportion of this circulation to the books in the libraries has also advanced from 263 for each 100 volumes in 1894 to 300 for each 100 in 1896.

**Comparative summary of free and other libraries and circulation
of free libraries, 1893-96**

	1893	1894	1895	1896	Increase for 1 year
Free libraries, no.	238	293	a 309	a 351	42
“ “ vols. ....	.....	1,049,869	1,127,199	1,313,299	186,100
Other libraries, no.	362	411	a 415	a 456	41
“ “ vols. ....	.....	3,083,509	3,265,800	3,334,362	68,562
All libraries, no.	600	704	723	806	83
“ “ vols.	3,851,945	4,133,378	4,392,999	4,647,661	254,662
Vols. per 1000 population...	591	634	674	713	39
Circ'n of free libs.	2,293,861	2,766,973	3,146,405	3,933,623	787,218
“ per day.	6285	7581	8620	10,777	2157
“ “ 1000 pop.	352	425	483	604	121
“ “ 100 vols. ....	.....	263	279	300	21

The large libraries. The comparative summary of libraries having 10,000 volumes or more shows a slight decrease in numbers, due to consolidation in one case and to failure to report in others. The total of volumes reported is larger by 153,637 than in 1895.

72 libraries report 10,000 volumes or more

46 “ 20,000 “

14 “ 50,000 “

8 “ 100,000 “

4 “ 200,000 “

1 library reports 300,000 “

The consolidated Astor and Lenox libraries form the New York public library with 367,808 volumes. The Mercantile library in New York added 7,000 volumes during the year. The state library increased by 14,500 and Columbia university library by 20,000. Cornell university added 12,890 volumes. The New York society library reached the mark of 100,000. Pratt institute free library in Brooklyn added 10,200 and with the New York bar association library passed the line of 50,000.

a Alfred univ. lib. with 10,222 volumes, of which 1000 are free for circulation, is entered under both free and other libraries.

Utica public library and the New York cathedral library passed the 20,000 line. The Jervis library at Rome, Alfred university library and the Masonic library at New York appear for the first time in the 10,000 volume list.

Comparative summary of libraries having 10,000 volumes or more 1893-96

	1893	1894	1895	1896	Increase for one yr
No. of libraries.....	77	81	74	72	a 2
No. volumes.....	3,080,478	3,268,306	3,211,787	3,365,424	153,637

Comparative growth of libraries. 54 reporting libraries added 1000 or more volumes each during the year. The largest accession, 20,580 volumes, was received by Columbia university. The New York public library added 15,594, the state library, 14,570, Cornell university, 13,578 and the New York free circulating library, 11,201.

Other additions were less than 7000 each, the Aguilar free library coming very close to that number. 28 libraries in this list are free for circulation.

Six libraries, established within the year, report their entire outfit of books as additions. 201,169 books were thus received in collections of 1000 or more, while the entire additions for the year to all the libraries are 296,498, showing that less than 7% of the libraries receive 67% of the additions.

Free libraries and their circulation. A table is given of free lending libraries that report at least 1000 volumes; and we find that 199 out of 351 have reached that size; 18 more than last year. The additions to these libraries for the year amounted to 114,851 volumes, an average of 577 to a library. Some added nothing; one added 11,201. The largest reports 106,440 volumes. Reported circulation varies from 0 to 686,504 volumes for the year, with a total of 3,775,787, an average of 18,973 to each library and 309 for each 100 volumes. In 1895 the average circulation for 181 libraries of the same class was 16,644 to a library with a ratio of 287 for each 100 volumes. Every item of comparison for the past four years shows a marked advance.

The following table gives the names of libraries whose circulation for the year was more than 500 for each 100 volumes. It includes 13 that have less than 1000 volumes and several branch libraries whose circula-

tion is also included with that of the united library. It will be noted that the list is much longer than a similar list given for 1895. Comparing this table with that we find the following for the first time among the 10 leading libraries: St Agnes free library in New York, Saratoga Springs public library, Fifth street branch of the Aguilar library in New York and Amsterdam library association.

Free libraries circulating more than 500 volumes per 100

No.	NAME OF LIBRARY	Volumes	Circulation	Circulation per 100 vols.
1	N. Y. free circ. lib., Harlem branch	6651	105,871	1591
2	N. Y. St Agnes free lib.	2800	32,782	1171
3	Saratoga Springs pub. lib.	2337	27,125	1160
4	Ellenville public lib.	1657	17,143	1035
5	Plattsburg public lib.	974	9763	1002
6	N. Y. Aguilar lib. 5th st. branch	2655	25,854	974
7	Amsterdam lib. ass'n	3109	29,512	950
8	N. Y. free circ. George Bruce branch.	19,300	180,407	935
9	N. Y. free circ. Muhlberg branch.	4793	43,553	908
10	Camden lib. ass'n	1220	10,978	892
11	N. Y. Aguilar free lib. E. B'dway branch ..	17,633	156,965	890
12	a N. Y. Aguilar free lib.	35,466	296,809	837
13	N. Y. Aguilar free lib. E. 59th st. branch ..	12,164	101,390	833
14	New York, Riverside free lib.	1930	15,738	815
15	Troy, Childrens neighborhood lib.	790	6021	762
16	a N. Y. free circ. lib.	90,446	686,504	759
17	Ballston Spa pub. lib.	851	6149	722
18	N. Y. free circ. Jackson sq. branch	13,412	94,132	701
19	Morristown pub. lib.	315	2166	688
20	Cattaraugus union sch. lib.	2143	14,500	677
21	N. Y. free circ. Ottendorfer branch	23,526	156,529	655
22	Bath Beach, New Utrecht free lib.	1549	10,013	646
23	Catskill public lib.	2303	14,286	616
24	Moriah, Sherman coll. inst. lib.	400	2350	587
25	Springfield free lib.	227	1329	585
26	Utica public lib.	21,187	118,167	558
27	Baldwinsville free acad. lib.	985	5472	555
28	Montour Falls, Havana free lib.	806	4456	553
29	Nyack library	3914	21,333	545
30	Fort Plain free lib.	1070	5699	533
31	Mechanicville union sch. lib.	900	4800	533
32	Tottenville union sch. lib.	375	2000	533
33	Brooklyn, Union for Christian work lib.	34,615	177,892	514
34	Clinton union sch. lib.	1557	8000	513
35	New York free circ. Bond st. branch.	19,956	102,034	511
36	Canton free lib.	931	4690	503
37	New Rochelle public lib.	3285	16,511	503
38	Wilson union sch. lib.	701	3520	502
39	Patchogue union sch. lib.	300	1500	500

a All branches

**Comparative summary of libraries of 1000 volumes or more free for lending,
1893-96**

	1893	1894	1895	1896	Increase for one year
No. of libraries	137	156	181	199	18
Volumes added.....	53,789	87,137	83,278	114,851	31,573
“ total	859,235	1,021,250	1,047,123	1,222,138	175,015
Circulation, total	2,244,572	2,665,269	3,012,694	3,775,787	763,093
“ average per 100 volumes	261	261	287	309	22

Free reference libraries. There are 70 libraries of 1000 volumes or more reported free for reference, one more than in 1895. The additions for the year to the libraries named are given as 104,255 volumes, but the actual increase reported for libraries of this class is 295,014, making a total of 1,905,642 volumes.

Three libraries classed as free for reference in 1895 are now free for circulation, and many then reported free to all are now reported free to a limited class. Doubtless there is much confusion on these points and public privileges are not definitely fixed. The following 17 libraries appear in this list for the first time.

Libraries first reported free for reference in 1896

Columbia university lib.	223,000 volumes
Syracuse university lib.	39,508 “
West Point U. S. military academy lib.	39,001 “
Corning library association lib.	7,000 “
New York, Presb. board of foreign missions lib.	7,000 “
Wappingers Falls, Grinnell library ass'n lib.	5,780 “
Lima, Genesee Wesleyan sem. lib.	5,290 “
New York Amer. soc. of civil engineers lib.	5,105 “
Glens Falls academy lib.	5,059 “
Fort Plain, Clinton liberal inst. lib.	3,564 “
New York, University settlement lib.	2,649 “
Rochester free academy lib.	2,340 “
Deposit union school lib.	1,913 “
Chester union school lib.	1,315 “
Hudson, Y. M. C. A. lib.	1,300 “
Warrensburg union school lib.	1,060 “
Gouverneur high school lib.	1,043 “

**Comparative summary of free reference libraries of 1000 volumes or more,
1893-96**

	1893	1894	1895	1896	Increase for one year
No. of libraries.....	57	61	69	70	1
Volumes added	108,918	81,781	71,371	104,255	32,884
“ total.....	1,395,692	1,335,252	1,610,628	1,905,642	295,014

College libraries. The comparative summary shows 50 colleges reporting their libraries; the same as in 1895. The addition of 63,188 volumes is reported and a total of 1,072,303 volumes for this class.

Comparative summary of college libraries 1893-96

	1893	1894	1895	1896	Increase for one year
No. of libraries.....	50	55	50	50	.....
Volumes added.....	67,101	64,530	50,005	63,188	13,183
“ total.....	882,833	992,633	1,010,737	1,072,303	61,566

Law libraries. A table is given of 14 law libraries arranged in order of size. This is by no means complete. Many important collections are either included in other reports or not reported. Eight of those whose names are given belong to the state or the county in which they are located. Most of these libraries are open to the public for reference. 268,783 volumes are in the 14 libraries, and 12,218 of these were added within the year.

SPECIAL REPORTS

Library buildings. Seymour library at Auburn received from Willard E. Case a gift of \$25,000 for a new building on condition of making the library free and the annual payment of a generous sum for support by the city.

Pratt institute, Brooklyn, has completed a new library building at a cost of \$190,000. It is built of brick with stone trimmings. The main building has three stories and covers 70 by 100 feet of ground. The adjoining stack room has five stack floors, each 49 by 53 feet, with a total capacity of 200,000 volumes. The building was opened May 26, 1896.

Fort Hamilton free library occupied its new quarters Oct. 1, 1895. The house was bought for \$2200.

At Hobart college, Geneva, the new Demarest building has been completed and occupied.

Herkimer free library received from Judge Robert Earl and his wife the gift of their handsome residence on the main street of the village, fully furnished for library use with ample grounds for future enlargement. The property is valued at \$35,000. The library was opened with public exercises Jan. 2, 1896.

The railroad branch of the Young men's Christian association of Hornellsville moved to the new building in October, 1895.

In Keene Valley the public library has bought a desirable lot for \$500 and a building will soon be erected.

Mount Vernon public library, now in rented rooms, is to have larger quarters in the new high school building.

The room of the Nassau free library has been newly painted and furnished.

In New York, Columbia university is erecting a library in the center of its group of new buildings on Morningside heights. The library is the gift of its president, Seth Low, will cost \$1,000,000 and have space for 1,200,000 volumes.

The New York genealogical and biographical society has bought the house 226 West 58th street out of the invested Cole legacy and life membership fees and is constructing for its library a detached fire-proof building in the rear with funds given for the purpose by members.

The New York bar association has provided greatly enlarged and improved quarters for its library on the upper floors of the new building erected by the association in West 44th street.

The New York law institute library in the post-office building has had a large room added during the year, doubling its capacity.

Pleasantville library association has a new building costing \$7250 including assembly hall and rooms for library, reading room and social purposes.

At Rome, the Jervis library reading room is enlarged by removal of partitions.

At Southampton, the building of the Rogers memorial library was opened March 1, 1896. The property is valued at 26,000 and includes an assembly hall.

In Troy, the Young men's association has received \$100,000 for a fire-proof marble library building now approaching completion to be

named the William Howard Hart memorial building. It is to contain a \$6000 stained glass window.

The following schools have added largely to their library facilities by the use of rooms remodeled and refitted, or by occupying rooms in new buildings.

Allegany union school	Friendship union school
Bay Shore "	Randolph, Chamberlain institute
Dexter "	Southampton union school
East Aurora "	Verona "
Elizabethtown "	Walden "

Gifts and special additions. Brooklyn library received \$10,000 from the estate of C. R. Lynde with the recommendation that the income be spent for books.

The Long Island branch of Pratt institute library, Brooklyn, received 1000 volumes from the Baylis family.

Cambridge union school library received 538 books from the library of Rev. Walter Long.

New York military academy at Cornwall-on-Hudson received from Col. Wright, president of the academy, 2051 volumes and 489 pamphlets given to the preparatory department after the completion of their new building.

The library of Hobart college, Geneva, received \$1000 from A. L. Chew of Geneva as a memorial of Arthur Cleveland Coxe jr, class of 1897, for a fund for buying archeological books. An equal amount is promised as a memorial of Harry May, class of 1897, by his mother and grandmother.

The college also received a bequest of \$1000 from Peter Richards of Geneva as a gift to the library fund.

Herkimer free library received from Judge Robert Earl and his wife, with the library building, a gift of over 2000 volumes fully catalogued and prepared for circulation.

Genesee Wesleyan seminary at Lima received 700 volumes from the library of Zenas Hurd; also gifts of sets from several friends.

Mt Vernon public library received 449 volumes from women of Mt Vernon.

Columbia university, New York, received \$10,000 from S. P. Avery increasing the Avery library fund to \$25,000; \$6000 from Mrs Samuel Lawrence and Mrs James R. Swords establishing the Alexander J.

Cotheal fund for oriental books : also an anonymous gift of \$10,000 for books.

New York public library secured the Robinson collection of American family and town histories containing 3763 volumes for \$11,289. John S. Kennedy presented the Thomas Addis Emmet collection of manuscripts, engravings and books relating to the American revolution, about 4000 volumes valued at \$200,000. J. S. Billings, director, presented 2000 medical volumes. These gifts are not included in the record of accessions.

Union college library at Schenectady received \$400 from graduates and 31 volumes from the American book company.

Sing Sing public library received 194 volumes from Mr William Ryder and an unbound set of Appleton's *Picturesque Europe*.

Rogers memorial library at Southampton received an endowment fund of \$5250.

Grinnell library at Wappingers Falls received \$100 from Irving Grinnell, its founder.

Wellsville public library received \$125 toward an endowment fund.

Westport library association received \$100 from Mr Charles Head of Boston.

Arrangement and cataloguing. Catholic institute library at Buffalo has a new card catalogue.

New Berlin union school library has been classified and a card catalogue made.

Columbia university, New York, has published a catalogue of the Avery architectural library, 17-1139 pages.

Five Points mission library, New York, has been reorganized and recatalogued.

New York public library has introduced electric lights into both Astor and Lenox buildings to keep them open from 9 to 6 all the year. In each building a collection of books of reference has been opened directly to the public.

St Agnes free library, New York, has been reclassified and has a first-class dictionary catalogue on cards.

Nunda union school library has been classified and rearranged with improved accommodations.

Oneonta public library has been moved to better quarters, classified and rearranged with new shelving and catalogue.

Richfield Springs union school library, and Syracuse high school library were recatalogued and bookcases of the latter remodeled.

Troy Young women's association added a new case for its library, which was thoroughly recatalogued.

Miscellaneous. New York free circulating library added a new branch June 3, 1896, to be called the Bloomingdale branch, located at 816 Amsterdam avenue, corner of W. 100th st.

The Young men's Christian association library in New York publishes weekly bulletins containing references pertinent to various subjects under debate by the Literary society of the association. It sent 34,600 papers and periodicals to U. S. army and navy posts.

The Jervis library association in Rome started an historical collection in a room used for study clubs.

The New York Cathedral library added two new branches.

The library school at Pratt institute, Brooklyn has added a second year to its course of study.

SUMMARY OF REPORTS OF NEW YORK LIBRARIES

1 July 1895—30 June 1896

The following tables are a summary of reports made to the regents under the University law of 1892. All libraries containing 300 volumes or more are included. Libraries are arranged in the alphabetic order of places.

Any item with † prefixed indicates that it is not a verified statement but the best obtainable estimate.

ABBREVIATIONS

<i>used under</i>	Source of charter
L Legislature	
G General law	
R Regents	
I Belonging to a chartered or University institution	
<i>used under</i>	Relation to the University
u Department of the University	
c Holding University charter	
a Admitted to the University	
i Belonging to a University institution	
r Registered by the University	
<i>used under</i>	Class of books
Gen. General	Hist. Historical
Med. Medical	Ped. Pedagogic
Theo. Theological	Stat. Statistical
Sol. Scientific	Phar. Pharmaceutical

used under Ownership and control

Pri. Private: belonging to an individual, family or firm and open to the public if at all, only by courtesy.

Mem. Membership: controlled by an association requiring an election for an admission or payment of a fee for the right to vote for trustees; e. g. society, association, club, atheneum and other proprietary libraries. A membership library may be open to the public and supported in part by taxation, but is not controlled by the voters or their representatives.

Bus. Business: open to any one who pays the fee, i. e. libraries run as a business, like the circulating maintained in many bookstores, and many mercantile libraries, though some of the latter are proprietary libraries.

End. Endowed: owned and controlled by the trustees of an endowment, usually a self-perpetuating body. An endowed library may be freely open to the public but is not owned or controlled by it. This does not include libraries belonging to endowed institutions, colleges, schools or churches.

Pub. Public: owned and controlled by the public through trustees elected by the voters or appointed by their representatives, but does not include government, school or institutional libraries.

Pub. D. Public district: the name given to a school district library when placed in control of independent trustees under laws of 1892, ch. 573, § 7.

Pub. sch. Public school: that form of public library organized under the laws in force from 1838-92, if it still remains in control of the school authorities.

Gov. Government: owned by the U. S., state or local government; e. g. state, department, court, garrison and similar libraries, but does not include those classed as public, school or institutional.

Inst. Institutional: belonging to institutions other than colleges, schools and churches; e. g. hospitals, asylums, prisons, Y. M. C. A., etc.

Coll. and sch. College and school: maintained for the use of students and teachers and owned and controlled by the institutions.

Par. Parish: owned and controlled by a church.

used under Support

End. Endowment or productive property

Tax. Taxation

St. State aid

Sdy. Local subsidy

G. Gifts

Gen. General funds

Pri. Private

used under Terms of use

F. Free

R. Free for reference only

Fl. Free to limited class

S. Subscription open to all

Sl. Subscription limited

Pri. Private

NEW YORK

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
1	Adams	Adams coll. inst. lib	1855	I	i
2	Addison	Addison pub. lib	1893	R	c
3	Afton	Union school lib	1874	I	i
4	Akron	Union school lib	1883	I	i
5	Albany	Acad. of Notre Dame lib		I	i
6	"	Albany acad. lib	?	I	i
7	"	Albany coll. of phar. lib		I	i
8	"	Albany fem. acad. lib		I	i
9	" 359 S. Pearl st. ..	Albany free lib	1891	R	c
10	"	Albany inst. lib	1824	I	...
11	"	Albany law sch. lib	1883	I	i
12	"	Cathedral acad. lib	1874	I	i
13	"	Catholic union lib	1887	I	r
14	"	Christian bros. acad lib	1869	I	i
15	"	Diocesan lending lib	1890	...	...
16	"	Dudley observatory lib	1856	I	i
17	"	N. Y. state lib	1818	L	u
18	"	Public school lib	1871	I	i
19	"	St Agnes school lib	1870	I	i
20	"	St John's acad. lib	1860	I	i
21	"	St Joseph's acad. lib	1891	I	i
22	"	Y. M. A. lib	1833	I	r
23	"	Y. M. C. A. lib	1857	I	r
24	" Union depot yd. ..	Y. M. C. A. R. R. branch lib ..	1884	...	...
25	"	Y. W. C. A. lib	1888	I	r
26	Albion	Albion pub lib	1893	R	c
27	"	Town lib	1891	...	...
28	"	Union school lib		I	i
29	Alexander	Union sch. lib	1836	I	i
30	Alexandria Bay	Holland lib. of Alexandria Bay ..	1896	R	c
31	Alfred	Alfred univ. lib	1857	I	i
32	"	Alfred univ. lib		I	r
33	Allegany	St Bonaventure's coll. lib	1875	I	i
34	"	St Elisabeth's acad. lib	1884	I	i
35	"	Union sch. lib	1893	I	i
36	Allen's Hill	Allen's Hill free lib. ass'n	1895	R	c
37	Amsterdam	Amsterdam lib. ass'n	1891	G	a
38	"	High sch. lib		I	i
39	"	St Mary's cath. inst. lib	1880	I	i
40	"	Y. M. C. A. lib .....		...	...
41	Andes	Union sch. lib	1893	I	i
42	Andover	Union sch. lib	1891	I	i
43	Angelica	Angelica lib. ass'n	1895	R	c
44	Angola	Union sch. lib		I	i
45	Annandale	St Stephen's coll. lib	1860	I	i
46	Autwerp	Ives sem. lib	1869	I	i

LIBRARIES

Name of Librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES			
					NO. ADDED LAST YEAR		Total no. in library	
					Given	Bought		
Salem G. Pattison	End. sch.	G. Gen.	Fl...	15	.....	1651	1
Mary S. Brewer	Pub. D.	Tax. St.	F.....	7	202	2412	2
.....	Pub. sch.	Tax. St.	F.....	61	.....	781	3
Orson Warren	Pub. sch.	Tax. St.	F.....	.....	76	751	4
.....	Sch.....	Gen. St.	Fl.....	.....	.....	1100	5
.....	Sch.....	Gen.....	Fl.....	.....	† 30	1500	6
.....	Phar	Coll.....	Gen.....	Fl.....	.....	.....	92	7
Lucy A. Plympton	Sch.....	Gen.....	Fl.....	.....	.....	2200	8
Edward Field	Mem.....	Tax. St.	F.....	31	429	3094	9
G. R. Howell	Inst.....	.....	Fl.....	.....	.....	5000	10
.....	Sch.....	Gen.....	Fl.....	.....	44	1426	11
.....	Sch.....	Gen.....	Fl.....	.....	30	1600	12
Frances E. Coughlin	Inst.....	St. Gen.	F.....	4	.....	1404	13
.....	Sch.....	Gen.....	Fl.....	50	121	2200	14
Joseph Gavit	Theo	Par.....	G.....	Fl.....	159	10	1250	15
.....	Sch.....	Gen.....	Fl.....	.....	.....	2000	16
Melvil Dewey	Sci.	Inst.....	G.....	Fl.....	.....	.....	2000	16
.....	Gov.....	St.....	R. Fl	4127	a10,443	b223,547	17
.....	Pub. sch.	Tax. St.	Fl.....	.....	.....	† 8000	18
.....	Sch.....	Gen.....	Fl.....	.....	.....	4050	19
Sister Vincent	Sch.....	Gen.....	Fl.....	† 50	† 50	† 700	20
.....	Sch.....	G.....	Fl.....	10	.....	1058	21
Nelly B. Lovejoy	Inst.....	Fees.....	R. S.	.....	450	† 17,000	22
A. A. Clarke	Inst.....	St. Gen.	R. Fl	148	472	4396	23
A. P. Gillette	Inst.....	Gen.....	F.....	6	3	1400	24
Alice Newman	Inst.....	St. G.....	R. Fl	.....	171	1512	25
Lillian A. Achilles..	Pub. D.	Tax. G.....	F.....	7	1	2872	26
Lillian A. Achilles..	Pub.....	Tax.....	F.....	52	297	1271	27
.....	Pub. sch.	Tax. St.	Fl.....	.....	.....	350	28
J. Howerth	Pub. sch.	Tax. St.	F.....	.....	.....	1133	29
Angelo O. Tucker	Pub. D.	St. G.....	F.....	312	391	703	30
E. M. Tomlinson	Coll.....	End. St.	R.....	398	261	10,222	31
E. M. Tomlinson	Coll.....	End. St.	F.....	.....	.....	1000	.....
.....	Coll.....	Gen.....	Fl.....	16	.....	7329	32
Sister M. Thomasina	Sch.....	Gen.....	Fl.....	81	.....	2240	33
Jennie L. Burr	Pub. sch.	Tax. St.	Fl.....	.....	231	625	34
Mary B. Allen	Mem.....	St. sdy.	F.....	.....	.....	411	35
Belle Huntley	Mem.....	St. G.....	F.....	540	236	3109	36
.....	Pub. sch.	Tax. St.	Fl.....	.....	.....	† 500	37
.....	Sch.....	Gen.....	Fl.....	.....	32	1138	38
C. T. Schaeffer	Inst.....	Gen.....	Fl.....	2	.....	300	39
G. N. Sleight	Pub. sch.	Tax. St.	F.....	15	89	580	40
Benj. G. Estes	Pub. sch.	Tax. St.	F.....	.....	37	299	41
Nellie M. Piatt	Mem.....	St. G.....	F.....	3	81	1584	42
.....	Pub. sch.	Tax. St.	Fl.....	.....	.....	575	43
R. B. Fairbairn	Coll.....	Gen.....	Fl.....	† 2250	.....	12,250	44
.....	Sch.....	St. Gen.	Fl.....	† 3	16	438	45

^a Including 6849 in the Public libraries division.

^b Including 26,961 in the Public libraries division.

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
1	250	750	240	10	12			
2	6731		225	10	10		\$265	\$150
3			185	15			23 75	23 75
4	† 1100	† 600	190	5	25		55	74 12
5								
6	†	†	† 60	1				
7								
8								
9	10,129	† 1800	307	59	59		600	200
10								
11		1426	188		66			
12	† 60	†	190	7	21			
13	1121	10	156	15	42			
14	200	200	160	10	10			
15	101		365	65	65			
16								
17	a 17,745	300,000	313	80	80			67,900
18								
19		660	198	2	72			
20	†	†	† 200	30	30			
21	† 220		180	35				
22	15,593	†	365	91	96			
23	6482	8533	365	78	82			200
24	1368	150	233	168	168			
25	3164		311	60	72	\$5		77 22
26	8089	† 1500	104	8	8		82	
27	3170	† 500	104	8	8		300	
28								
29	410	25	190	35				
30	783		26	6				200
31		† 5500	230	34	34	200		200
32	4857							
33		† 75	160		4			
34	39,700	39,750	191	2	14			
35	1431		40	1			50	128 40
36	825		52	† 12				
37	29,512	438	308	39	39			200
38								
39	†		102	4				
40	47	25	333	14	14			
41	645	†	183	1			25	25
42		† 1500	† 200	30	30		48 67	
43	2652		103	4				200
44	†	†	216	12				
45	†	†	40		† 3			24 05

a Including 7,087 from capitol library.

LIBRARIES (continued)

FROM		Total receipts	PAYMENT FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	\$40	\$40	\$40	.....	.....	\$40	1
.....	5 85	420 85	146 01	\$101 50	\$67 37	314 88	2
.....	.....	47 50	.....	.....	.....	.....	3
.....	.....	129 12	.....	.....	.....	.....	4
.....	.....	.....	.....	.....	.....	.....	5
.....	75	75	75	.....	.....	75	6
.....	.....	.....	.....	.....	.....	.....	7
.....	.....	.....	.....	.....	.....	.....	8
.....	581 79	1,381 79	394 71	312	272 98	979 69	9
.....	.....	.....	.....	.....	.....	.....	10
.....	.....	.....	55 85	.....	110	165 85	11
.....	30	30	30	.....	.....	30	12
.....	150	150	137	100	13 25	150 25	13
.....	.....	.....	125	.....	.....	125	14
.....	66	66	23 60	.....	2 24	25 84	15
.....	.....	.....	.....	.....	.....	.....	16
.....	.....	67,900	b 27,586 15	c 32,224 62	d 3,862 02	63,672 79	17
.....	.....	.....	.....	.....	.....	.....	18
.....	50	50	91 85	.....	.....	91 85	19
.....	.....	.....	1 175	.....	.....	1 175	20
.....	6	6	6	.....	.....	6	21
\$515 50	1,011 95	1,527 45	490 71	872 50	132 69	1,495 90	22
.....	1,478 10	1,678 10	757 93	900	20 17	1,678 10	23
.....	10	10	3	.....	7	10	24
.....	211 73	293 95	74 10	40	5	119 10	25
.....	.....	.....	.....	.....	.....	.....	26
.....	8 08	90 08	4	78	2 25	84 25	27
.....	1 98	301 98	291 45	52	150	344 95	28
.....	.....	.....	.....	.....	.....	.....	29
.....	280 56	480 56	343 48	.....	79 17	422 65	30
.....	.....	.....	.....	.....	.....	.....	31
48 80	270	718 80	334 68	270	7 11	611 79	32
.....	.....	.....	.....	.....	.....	.....	33
.....	20	20	.....	.....	75	75	34
.....	26 50	26 50	14 15	.....	16	30 15	35
.....	27 89	206 29	177 38	.....	.....	177 38	36
5	.....	5	.....	5	.....	5	37
.....	.....	.....	.....	.....	.....	.....	38
19	1,586 87	1,805 87	739 65	559 77	536 59	1,836 01	39
.....	.....	.....	.....	.....	.....	.....	40
.....	66 12	66 12	66 12	.....	.....	66 12	41
.....	.....	.....	.....	.....	.....	.....	42
.....	.....	50	50	.....	.....	50	43
.....	.....	.....	.....	.....	.....	.....	44
.....	22 10	70 77	70 77	.....	.....	70 77	45
.....	.....	200	127 80	.....	72 91	200 71	46
.....	.....	.....	.....	.....	.....	.....	47
.....	.....	.....	19 50	100	.....	119 50	48
.....	.....	.....	47 50	.....	60	48 10	49

^bIncluding \$5820 for Public libraries division.

^cIncluding \$7084 for Public libraries division.

^dIncluding \$2071.48 for Public libraries division.

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
46	Arcade	Union sch. lib. ....	.....	I	i
47	Argyle.....	Union sch. lib.	1856	I	i
48	Athens	Union sch. lib. dist. no. 2	?	I	i
49	Attica	Stevens mem. lib.	1894	.....	.....
50	"	Union sch. lib.	1868	I	i
51	Auburn.....	High sch. lib. ....	.....	I	i
52	"	Seymour lib.	1876	G	r
53	Auburn.....	State prison lib. ....	.....	I	.....
54	"	Theological sem. lib.	1820	I	i
55	"	Y. M. C. A. lib.	?	I	.....
56	Aurora	Wells coll. lib.	1868	I	i
57	Avoca	Union sch. lib.	1871	I	i
58	Avon	Union sch. lib.	1881	I	i
59	Babylon	Union sch. lib.	1892	I	i
60	Bainbridge.....	Union sch. lib.	1873	I	i
61	Baldwinsville.....	Baldwinsville free acad. lib.	1868	I	i
62	Ballston Spa.....	Ballston pub. lib.	1893	R	c
63	"	Saratoga co. law lib. ....	.....	L	.....
64	"	Union sch. lib. ....	.....	I	i
65	Batavia	State sch. for the blind.....	.....	L	.....
66	"	Union sch. lib.	1853	I	i
67	Bath.....	Davenport free lib.	1869	G	.....
68	"	Haverling union sch. lib. ....	.....	I	i
69	Bath Beach.....	New Utrecht free lib.	1895	R	c
70	Bath-on-Hudson.....	N. Greenbush dist. no. 6, pub. lib.	1893	R	c
71	Bay Ridge.....	Bay Ridge free lib.	1888	R	c
72	Bay Shore.....	Union sch. lib.	1894	I	i
73	Bayside.....	Union sch. lib. ....	?	.....	.....
74	Beedes	Keene Hights lib. club.	1888	.....	.....
75	Belfast.....	Genesee Valley sem. and un. sch. lib.	1857	I	i
76	Belleville	Union acad. lib.	1826	I	i
77	Belmont.....	Belmont lit. and hist. soc. free lib.	1885	R	c
78	"	Union sch. lib.	1889	I	i
79	Bergen	Union sch. lib.	1893	I	i
80	Binghamton.....	City sch. lib.	1861	.....	i
81	"	Lady Jane Grey sch. lib.	1882	.....	.....
82	"	St Joseph's acad. lib.	1862	I	i
83	"	Supreme court lib. ....	.....	L	.....
84	"	Y. M. C. A. R. R. branch lib.	1889	.....	.....
85	Blauvelt	School lib. ....	.....	.....	.....
86	Bolivar	Union sch. lib.	1890	I	i
87	Boonville.....	Erwin lib. and inst.	1885	G	a
88	"	Union sch. lib.	1878	I	i
89	Brasher Falls.....	Brasher and Stockholm un. sch. lib.	1886	I	i
90	"	St Joseph's acad. lib.	1891	I	i

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
Francis M. Smith		Pub. sch.	Tax. St.	F .....	.....	148	653 46
E. C. Hoguewire		Pub. sch.	Tax. St.	F	8	13	1041 47
.....		Pub. sch.	Tax. St.	F	11	218	377 48
Laura E. Leland		Pri	Pri	F .....	.....	18	6954 49
.....		Pub. sch.	Tax. St.	F .....	.....	.....	1754 50
.....		Pub. sch.	Tax. St.	Fl .....	.....	.....	1000 51
Martha A. Bullard		Mem. end	End	F	87	293	12,350 52
Horatio Yates		Inst	St	Fl .....	.....	.....	2524 53
Arthur S. Hoyt	Theo	Coll	End	F	† 100	1138	23,912 54
W. H. Wells		Inst	Gen	R. Fl.	35	25	825 55
.....		Coll	G. Gen.	Fl .....	.....	.....	5614 56
C. E. Butron		Pub. sch.	Tax. St.	Fl .....	.....	23	300 57
R. J. Wallace		Pub. sch.	Tax. St.	F .....	.....	236	1165 58
.....		Pub. sch.	Tax. St.	Fl .....	.....	157	935 59
Fred W. Crumb		Pub. sch.	Tax. St.	F	57	100	1377 60
Emma Y. Emerson		Pub. sch.	Tax. St.	F	1	.....	985 61
Harriet B. Curtiss		Pub	St. G	F .....	.....	13	851 62
Henry L. Grose	Law	Gov	St	R .....	.....	50	1100 63
.....		Pub. sch.	Tax. St.	Fl .....	.....	.....	293 64
Gardner Fuller		Gov	St	Fl .....	.....	72	1603 65
Agnes Wiard		Pub. sch.	Tax. St.	F .....	.....	778	11,572 66
H. L. Underbill		Pri. Mem.	Pri	R. Fl.	.....	100	9200 67
S. D. Miller		Pub. sch.	Tax. St.	F	9	13	403 68
Julia R. Guyn		Mem	St. G	F	167	94	1549 69
W: A. Cuzner		Pub. D	Tax. St.	F	1	116	† 1350 70
N. DeG. Doubleday		Mem	St. G	F	126	457	3943 71
Claude A. DuVall		Pub. sch.	Tax. St.	Fl	1	121	772 72
F. K. Montfort		Pub. sch.	Tax. St.	Fl .....	.....	100	300 73
E: I. H. Howell		Mem	G. Fees.	Sl	85	20	1580 74
Fred W. Gray		Pub. sch.	Tax. St.	F .....	.....	223	553 75
.....		Sch	Gen	F .....	.....	.....	2150 76
Ella Sortore		Mem	St. G	F	37	222	1626 77
Alice Gorton		Pub. sch.	Tax. St.	F .....	.....	100	650 78
H. D. Bartlett		Pub. sch.	Tax. St.	F	16	108	620 79
Mrs J. W. Clonney		Pub. sch.	Tax	F	14	973	9957 80
Mary R. Hyde		Pri	Gen	Fl	10	20	1000 81
.....		Sch	Gen	Fl .....	.....	22	480 82
Emma M. Harris	Law	Gov	St	R .....	.....	175	10,792 83
G. L. Nichols		Inst	G	S	120	9	715 84
Caroline M. Keife		Pub. sch.	Tax. St.	Fl .....	.....	48	398 85
A. J. Glennie		Pub. sch.	Tax. St.	Fl	5	20	600 86
P. W. Fiske		End	End. St.	F .....	.....	200	2696 87
C. H. Warfield		Pub. sch.	Tax. St.	Fl .....	.....	.....	635 88
H. W. Stearns		Pub. sch.	Tax. St.	F .....	.....	30	816 89
Sister M. de la Salle		Sch	G. Gen.	Fl .....	.....	25	421 90

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
46	825	.....	180	5	.....	.....	\$65 45	\$50
47	400	.....	212	2	.....	.....	.....	49
48	667	.....	200	1	25	.....	100	125
49	10,365	.....	104	16	16	.....	.....	.....
50	.....	.....	.....	.....	.....	.....	.....	.....
51	.....	.....	188	.....	25	.....	.....	.....
52	16,001	.....	305	54	54	\$1672 70	.....	.....
53	.....	.....	.....	.....	.....	.....	.....	.....
54	.....	.....	313	21	21	747	.....	.....
55	600	.....	300	72	72	.....	.....	.....
56	.....	.....	.....	.....	.....	.....	.....	.....
57	55	.....	200	30	30	.....	20	40
58	1500	.....	40	1	.....	.....	125	125
59	.....	.....	189	5	30	.....	100	86 46
60	390	800	205	2	15	.....	40 30	7 00
61	5472	400	200	1	.....	.....	.....	.....
62	6149	.....	244	5	.....	.....	.....	.....
63	.....	.....	313	.....	.....	.....	.....	.....
64	.....	.....	.....	.....	.....	.....	.....	.....
65	.....	.....	.....	.....	.....	.....	.....	.....
66	21,563	.....	350	60	75	189 20	300	.....
67	8968	.....	180	10 1/2	.....	.....	.....	.....
68	.....	.....	187	30	30	.....	10	.....
69	10,013	.....	300	36	36	.....	.....	200
70	6344	.....	148	6	.....	.....	146 39	50
71	12,949	.....	306	39	39	.....	.....	200
72	.....	.....	192	5	35	.....	125	160
73	.....	.....	40	6	30	.....	30	27 61
74	1300	200	78	58	62	.....	.....	.....
75	1520	.....	195	5	30	.....	43 43	87 87
76	450	400	200	10	10	.....	.....	.....
77	4766	1000	208	7	9	.....	.....	100
78	1256	.....	190	1 1/2	.....	.....	.....	165 14
79	.....	.....	40	1	.....	.....	25	43 24
80	47,282	1000	273	26	26	.....	2350	.....
81	.....	.....	365	6	10	.....	.....	.....
82	120	150	200	.....	.....	.....	.....	.....
83	.....	.....	.....	.....	.....	.....	.....	.....
84	453	.....	313	96	96	.....	.....	.....
85	200	300	200	30	.....	.....	10	10
86	1684	80	190	5	.....	.....	.....	.....
87	7773	201	309	12	42	799	.....	200
88	50	200	195	30	30	.....	.....	.....
89	200	.....	190	2	6	.....	25	50
90	.....	300	183	.....	30	.....	.....	.....

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....		\$115 45	\$115 45	.....	.....	\$115 45	46
.....	\$49	98	98	.....	\$2 50	100 50	47
.....		225	202 11	.....	.....	202 11	48
.....				.....	.....		49
.....				.....	.....		50
.....				.....	.....		51
.....	204 27	1,866 97	482 62	\$925 37	777 33	2,185 32	52
.....							53
.....	873 16	1,620 16	1,407 61	1300	.....	1,707 61	54
.....			20	.....	10	30	55
.....				.....	.....		56
.....		60	40	.....	.....	40	57
.....		250	245	.....	5	250	58
.....		186 46	186 46	.....	.....	186 46	59
.....		47 30	47 30	.....	.....	47 30	60
.....			1 75	.....	.....	1 75	61
.....	204	204	34	96	97 61	227 61	62
.....				.....	.....		63
.....				.....	.....		64
.....				.....	.....		65
.....	81 83	571 03	1,055 83	1,138	299 09	2,492 92	66
.....		10	10	.....	.....	10	67
.....	507 55	707 55	177 88	300	214 46	692 34	68
.....	1 26	197 65	109 02	60	15 53	184 55	69
.....				.....	.....		70
.....	560 83	760 83	323 34	430 65	206 36	960 35	71
.....	12	297	227	.....	.....	227	72
.....		57 61	57 61	.....	.....	57 61	73
1 \$200	1 \$100	1 \$300	1 \$80	1 \$84	1 \$136	1 \$300	74
.....	44 44	175 74	175 87	.....	3 69	179 56	75
.....				.....	.....		76
.....	9 40	9 40	9 40	.....	.....	9 40	77
.....	235	335	200	.....	135	335	78
.....	165 14	330 28	162 50	.....	5	167 50	79
.....	58 88	127 12	132 88	.....	.....	132 88	80
.....	94	2,444	1,148 33	950	123 19	2,221 52	81
.....			1 \$100	.....	.....	1 \$100	82
.....			51	.....	.....	51	83
.....				600	.....	600	84
.....	10	10	10	.....	.....	10	85
.....		20	21 75	.....	.....	21 75	86
.....				.....	.....		87
.....		999	400	400	199	999	88
.....				.....	.....		89
.....		75	43 30	.....	10 25	53 55	90
.....			26 25	.....	.....	26 25	91

NEW YORK

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
91	Brewster	Union sch. lib	1890	I	i
92	Bridgehampton	Hampton lib	1876	G	...
93	Bridgewater	Union sch. lib .....	.....	I	i
94	Brocton	Union sch. lib .....	.....	I	i
95	Bronxville	Sch. lib. dist. no. 2	1870	.....	.....
96	Brookfield	Union sch. lib	1847	I	i
97	Br'kl'n, Lafayette av ...	Adelphi acad. lib	1869	I	i
98	" 1143 Bedford av.	Bedford circ. lib.	1876	.....	.....
99	"	Berkeley inst. lib.	1886	I	i
100	"	Boys' high sch. lib	1895	I	i
101	"	Brooklyn coll. of phar. lib	1891	I	i
102	" 16 Court House.	Brooklyn law lib. 2d jud. dist	1850	L	...
103	" 197 Montague st	Brooklyn lib.	1857	L	...
104	" 209 Clinton av.	Female inst. of the Visitation lib ..	.....	F	i
105	" Pierrepont st.	Long Island hist. soc. lib	1863	L	...
106	" 356 Bridge st ...	Medical soc. of Kings co. lib	1845	I	...
107	" Joralemon n. C't	Packer col. inst. lib.	1846	I	i
108	" Livingst'n n. C't	Polytechnic inst. Spicer mem. lib ..	1891	I	i
109	" 215 Ryerson st.	Pratt inst. free lib	1888	I	i
	" 571 Atlantic av.	Long Island branch .....	.....	.....	.....
110	" 283-87 Union st.	St Agnes fem. sem. lib. ....	.....	I	i
111	" 300 Baltic st ...	St Francis coll. lib	1884	I	i
112	" 721-23 Carroll st	St Francis Xavier acad. sch. lib. ....	.....	I	i
113	"	St John's coll. lib .....	.....	I	i
114	"	St Thomas Aquinas acad. lib. ....	.....	I	i
115	" 67 Sch'rm'rh'n st	Union for Christian work free lib ..	.....	I	...
116	" Schermerhorn st	Y. W. C. A. lib	1888	I	...
117	Brushton	St Philomena's acad. lib	1893	I	i
118	Buffalo, Main st	Buffalo cath. inst. lib	1866	I	r
119	"	Buffalo coll. of phar. lib.	1886	I	i
120	"	Buffalo hist. soc. lib	1862	I	r
121	"	Buffalo lib	1837	L	r
122	"	Buffalo soc. of nat. sciences lib.	1863	I	...
123	"	Buffalo state hosp. lib	1880	I	...
124	" Ellicott st	Buffalo Turnverein lib .....	.....	I	...
125	"	Canisius coll. lib	1870	I	i
126	"	Erie railroad lib	1874	I	...
127	"	German Martin Luther theo. sem. lib	1854	I	i
128	" cor. Main & Ed.	German Y. M. A. lib	1841	I	...
129	"	Grosvenor pub. lib	1859	L	a
130	" C't & Fr'nk'n st.	High sch. lib	1854	I	i
131	" Prospect av.	Holy Angels acad. lib	1861	I	i
132	" 2064 Main st ...	Inst. of the sisters of St Joseph lib ..	1891	I	i
133	"	Le Contenlx St Mary's inst. lib. a. ...	1862	.....	.....
134	"	Niag. univ. med. dep't lib	1887	I	i
135	"	N. Buffalo cath. ass'n and lib	1886	I	...

a For deaf mutes.

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES			
					NO. ADDED LAST YEAR		Total no. in library	
					Given	Bought		
Henry S. Purdy.....	Pub. sch.	Tax. St.	F...	5	2	320	91
John F. Youngs.....	End.....	End.....	S...	10	55	4971	92
Adelbert Lewis.....	Pub. sch.	Tax. St.	F.....	.....	60	340	93
.....	Pub. sch.	Tax.....	F.....	.....	.....	1 500	94
R. E. Young.....	Pub. sch.	Tax.....	F.....	.....	150	1560	95
O. S. Rogers.....	Pub. sch.	Tax. St.	F.....	.....	50	500	96
Mabel A. Farr.....	Sch.....	St. Gen.	Fl...	30	74	5940	97
.....	Bus.....	Fees.....	S.....	.....	.....	4 000	98
J. W. Abernethy.....	Sch.....	G.....	Fl...	80	.....	2 2536	99
D. W. E. Burke.....	Pub. sch.	Tax. St.	Fl...	70	.....	3703	100
.....	Phar	Coll.....	Gen.....	Fl...	.....	.....	181	101
S. C. Betts.....	Law	Mem Gov	Tax. St.	Fl S.	.....	1067	18,950	102
Willis A. Bardwell.....	Mem.....	End. Fees	S.....	c922	c3311	c124,299	103
.....	Sch.....	Gen.....	Fl...	.....	.....	1 2048	104
Emma Taedteberg.....	Mem.....	End. Gen	S.....	2152	890	57,042	105
W. Browning.....	Med.	Inst.....	Gen.....	R.....	.....	d 502	d 1 7500	106
Hannah J. Garahan.....	Sch.....	Gen.....	Fl...	58	235	6594	107
Mary H. Chadwick.....	Coll.....	End.....	Fl...	62	60	7222	108
Mary W. Plummer.....	Inst.....	End.....	F.....	715	4073	60,023	109
.....	5000	.....
.....	Sch.....	Gen.....	Fl...	.....	.....	680	110
Brother Angelo.....	Coll.....	Fees.....	Fl...	.....	40	4100	111
.....	Sch.....	Gen.....	Fl...	.....	.....	500	112
.....	Coll.....	Gen.....	Fl...	.....	.....	7200	113
Sr. M. Camilla.....	Sch.....	Gen.....	Fl...	.....	.....	700	114
Fanny Hull.....	Inst.....	Sdy. Gen.	F.....	787	2797	34,615	115
Fanny D. Fish.....	Inst.....	G. Gen...	Fl...	663	37	7500	116
M. P. Somerville.....	Sch.....	Gen.....	Fl...	25	89	297	117
Eleanor E. Davie.....	Inst.....	Gen.....	R. S.	172	250	6718	118
.....	Phar	Coll.....	Gen.....	Fl...	.....	12	122	119
E. D. Strickland.....	Mem.....	St. Gen.	R. S.	321	2	9144	120
J. N. Larned.....	Mem.....	End. Fees	eR. S.	f 985	f 3393	f 80,084	121
J. N. Larned.....	Sci.	Inst.....	Gen.....	R.....	127	.....	3581	122
W. E. Burr.....	Inst.....	St.....	Fl...	.....	1 50	1 1000	123
Frank Reuter.....	Mem.....	Gen.....	Fl...	85	170	2005	124
H. A. Hartmann.....	Coll.....	Gen.....	Fl...	1 110	1 990	1 19,500	125
Sue Dana Wooley.....	Inst.....	Fees Gen	Sl...	100	.....	4000	126
.....	Theo	Coll.....	Gen.....	Fl...	6	.....	1 1523	127
Fred Frankenstein.....	Mem.....	End. Fees	Sl...	60	186	6871	128
E. P. Van Duzee.....	Pub.....	End. St.	R.....	219	663	1 40,000	129
Ada M. Kenyon.....	Pub. sch.	Tax. St.	Fl...	.....	520	2958	130
Sister St. Mary.....	Sch.....	Gen.....	Fl...	.....	.....	1 2082	131
Sister M. of Sac. H'tt.	Sch.....	Gen.....	Fl...	4	86	1 1140	132
Sister M. Isadore.....	Sch.....	Gen.....	Fl...	.....	8	700	133
.....	Med.	Coll.....	Gen.....	Fl...	.....	.....	665	134
Jacob Kientz.....	Mem.....	Fees Gen.	R. S.	.....	67	1628	135

b Including principal's library of 2000 volumes. c For year ending Feb. 29, 1896. d For year ending Jan. 1, 1896. e Free to 1000 pupils in the public school. f For year ending Jan. 3, 1896.

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
91	† 350	† 300	200	2	40		\$4	
92	976	† 60	300	52	52	\$613 95		
93	400		228	6	8		3 75	\$17 23
94								
95	1216	2	52	1	1		100	
96	150	†	180	10	30			25
97	6614	†	160	37½	37½			30
98			313	78				
99	† 200	† 1800	250	25	25			
100	193	† 20,000	204		30		750	750
101								
102								
103	92,116	65,000	352	75	84	9,048 93		
104								
105		†	307		13	6,313 74		
106	†		314		78			
107		†	200		30			
108	550		240	40	40	500		
109	280,250	15,481	307	64½	75			
110								
111		20,000	275		2			
112								
113								
114			365	30	30			
115	177,892	3,217	306	66	66		5,000	
116	23,902	†	307	73½	75			
117		†250	194		30			
118	10,000	†	330	75	75	50		
119		†100	313		54			
120		†	277		48			
121	140,651	44,585	359	72	77	15,417 36		200
122								
123			52	1				
124	570	490	300	8	42			
125			† 300	†				
126	†9,000	100	300	72	72			
127		†	240		†			
128	5,010		309	46½	46½	81 89		
129		†24,000	253		54	1,820	4,000	200
130	†	†	200		30		500	500
131			365	3	70			
132		†	200		7			
133		500	200		12			
134								
135	1,282	†	366	24	24			

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
\$47 11	\$12	\$4 673 06 20 98	\$4 176 62	\$194	\$189 25	\$4 559 87	91
.....	.....	.....	.....	.....	.....	.....	92
.....	.....	.....	.....	.....	.....	.....	93
.....	.....	100	100	110	.....	210	94
.....	.....	.....	.....	.....	.....	.....	95
.....	25	50	50	.....	.....	50	96
.....	30	60	203 71	600	11 21	814 92	97
.....	.....	.....	.....	.....	.....	.....	98
.....	70	70	70	.....	.....	70	99
.....	.....	1,500	.....	1,200	.....	1,200	100
.....	.....	.....	.....	.....	.....	.....	101
9,836 93	2,351 68	21,237 54	5,910 63	4,800 10,134 19	5,617 12	4,800 21,661 94	102
2,705	803	9,821 74	2,489 69	5,031 76	4,114 49	11,635 94	103
.....	.....	.....	.....	.....	.....	.....	104
.....	.....	.....	.....	.....	.....	.....	105
.....	.....	.....	.....	.....	.....	.....	106
.....	300	300	.....	.....	.....	.....	107
.....	2 81	502 81	.....	.....	.....	.....	108
.....	.....	.....	.....	.....	.....	.....	109
.....	.....	.....	.....	.....	.....	.....	110
120	.....	120	100	.....	.....	100	111
.....	.....	.....	.....	.....	.....	.....	112
.....	.....	.....	.....	.....	.....	.....	113
1,400	25	25 6,400	20 35 3,349 43	3,278	508	20 35 7,135 43	114
.....	.....	.....	.....	.....	.....	.....	115
.....	.....	.....	.....	.....	.....	.....	116
.....	.....	.....	.....	.....	.....	.....	117
1,124	.....	.....	.....	.....	.....	.....	118
.....	.....	.....	.....	.....	.....	.....	119
.....	.....	.....	.....	.....	.....	.....	120
4,405 75	20,998 43	41,021 54	7,554 87	8,607 12	5,297 14	21,459 13	121
.....	.....	.....	.....	.....	.....	.....	122
.....	.....	.....	.....	.....	.....	.....	123
.....	.....	.....	.....	.....	.....	.....	124
.....	.....	.....	.....	.....	.....	.....	125
.....	.....	.....	.....	.....	.....	.....	126
.....	.....	.....	.....	.....	.....	.....	127
672 50	55 31	809 70	1,537 11	360	510 90	2,408 01	128
.....	.....	6,020	1,378 37	2,545	1,823 56	5,746 93	129
.....	.....	1,000	1,000	.....	.....	1,000	130
.....	.....	.....	.....	.....	.....	.....	131
.....	.....	.....	.....	.....	.....	.....	132
.....	.....	.....	.....	.....	.....	.....	133
.....	.....	.....	.....	.....	.....	.....	134
.....	613 28	613 28	78 32	.....	.....	78 32	135

NEW YORK

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
136	Buffalo, 564 Franklin st.	St Margaret's sch. lib.	1884	I	i
137	" 74 Franklin st.	St Mary's acad. & ind. fem. sch. lib.	1863	I	i
138	"	Univ. of Buffalo med. dep't lib.	1845	I	ir
139	" 86 Delaware av.	Women's educ'n and indust. un. lib.	1884	I	r
140	" 19 W. Mohawk st	Y. M. C. A. lib.	1853	I	r
141	Cambridge	Union sch. lib.	1840	I	i
142	Camden	Camden lib. ass'n	1891	R	c
143	"	Union sch. lib.		I	i
144	Canaan Four Corners	Canaan pub. lib.	1893	R	c
145	Canajoharie	Union sch. lib.	?	I	i
146	Canandaigua	Canandaigua acad. lib.	1795	I	i
147	"	Union sch. lib.	1877	I	i
148	"	Wood lib. ass'n	1868	LR	c
149	Canaseraga	Union sch. lib.	1877	I	i
150	Canastota	Union sch. lib.	?	I	i
151	Candor	Candor free acad. lib.	1868	I	i
152	Canisteo	Canisteo acad. lib.	1871	I	i
153	Canton	Canton free lib.	1891	R	c
154	"	Herring lib. St Lawrence univ.	1865	I	i
155	"	Union sch. lib.		I	i
156	Cape Vincent	Union sch. lib.	1875	I	i
157	Carmel	Drew sem. and fem. coll. lib.	1868	I	i
158	"	Literary union lib.	1881	G	---
159	Carthage	Augustinian inst. lib.	1886	I	i
160	"	High sch. lib.	1866	I	i
161	Castile	Union sch. lib.		I	i
162	Catskill	Catskill free acad. lib.	1868	I	i
163	"	Catskill pub. lib.	1893	R	c
164	"	St Patrick's acad. lib.	1892	I	i
165	Cattaraugus	Union sch. lib.	1887	I	i
166	Cazenovia	Cazenovia sem. lib.	1894	I	i
167	"	Cazenovia pub. lib.	1886	G	---
168	Central Square	High sch. lib.	1887	I	i
169	Central Valley	Union sch. lib.	1895	I	i
170	Champlain	Union sch. lib.	1890	I	i
171	Charlotte	Union sch. lib.		I	i
172	Chateaugay	Union sch. lib.	1883	I	i
173	Chatham	Union sch. lib.	1881	I	i
174	Cherry Valley	Union sch. lib.	?	I	i
175	Chester	Union sch. lib.	1846	I	i
176	Chittenango	Yates union sch. lib.	1871	I	i
177	Cincinnati	Union sch. lib.	1895	I	i
178	Clarence	Parker union sch. lib.	1869	I	i
179	Claverack	Claverack fr. lib. & read. room ass'n	1890	G	a
180	Claverack	Hudson River inst. lib.	1854	I	i

LIBRARIES (continued)

Name of Librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
Mary Moffitt.....		Sch.....	Gen.....	Fl.....		4	985 136
Matthew D. Mann.....	Med.	Sch.....	Gen.....	Fl.....		2	1 400 137
Grace S. Benedict.....		Coll.....	St. Gen..	R.....	510		5535 138
W. F. Hirsch.....		Inst.....	Gen.....	R.....			800 139
		Inst.....	St. Gen..	R. Sl.	48	373	6776 140
R. R. Law.....		Pub. sch.	Tax. St..	F.....	538	353	3814 141
Grace S. Case.....		Mem.....	St. Fees..	F.....	16	228	1220 142
		Pub. sch.	Tax.....	Fl.....		32	372 143
Nellie F. Bates.....		Pub. D..	Tax. St..	F.....		46	604 144
Emma P. Abell.....		Pub. sch.	Tax. St..	F.....		184	1301 145
J. Firman Coar.....		Sch.....	Gen.....	Fl.....			1649 146
A. P. Hanna.....		Pub. sch.	Tax. St..	F.....			3203 147
Sara N. Lee.....		Mem.....	Fees.....	F.....			1 6500 148
Henry E. Adams.....		Pub. sch.	Tax. St..	F.....		65	600 149
G. H. Ottaway.....		Pub. sch.	Tax. St..	Fl.....			1263 150
C. G. Sanford.....		Pub. sch.	Tax. St..	F.....		21	642 151
Walter D. Hood.....		Sch.....	Gen.....	Fl.....	5		1431 152
Josephine Paige.....		Mem.....	Tax. St..	F.....	12	126	931 153
		Coll.....	End. Gen.	Fl.....			11,850 154
Arthur E. Chase.....		Pub. sch.	Tax. St..	R. Fl			1890 155
H. R. Smith.....		Pub. sch.	Tax. St..	F.....		1	436 156
		Coll.....	Gen.....	Fl.....			13,000 157
Clayton Ryder.....		Mem.....	Gen.....	R. S.	14	8	1,742 158
		Sch.....	Gen.....	Fl.....			360 159
Hattie A. Merrill.....		Pub. sch.	Tax. St..	F.....			11,200 160
Minnie E. Hoagland.....		Pub. sch.	Tax. St..	F.....	3	83	556 161
Ed. Harris.....		Pub. sch.	Tax. St..	R. A.		96	651 162
Emily E. Becker.....		Pub. D..	Tax. St..	F.....	103	303	2,303 163
		Sch.....	Gen.....	Fl.....		21	1724 164
J. L. Walthart.....		Pub. sch.	Tax. St..	F.....	22	193	2,143 165
		Sch.....	St. G....	Fl.....			3,405 166
J. H. TenEyck Burr.....		Mem.....	G. Fees..	F.....	200	102	3,695 167
C. Orrin Du Bois.....		Pub. sch.	Tax. St..	F.....		10	497 168
Edwin Cornell.....		Pub. sch.	St. G....	Fl.....	17	90	520 169
Mylo E. Ryan.....		Pub. sch.	Tax. St..	F.....		47	644 170
		Pub. sch.	Tax. St..	Fl.....			500 171
E. L. Stevens.....		Pub. sch.	Tax. St..	F.....	2	124	1,216 172
Ella E. Wagar.....		Pub. sch.	Tax. St..	F.....	4	332	2,785 173
Sarah W. Shipway.....		Pub. sch.	Tax. St..	F.....		70	836 174
		Pub. sch.	Tax. St..	R. Fl			1,315 175
W. M. Fort.....		Pub. sch.	Tax. St..	Fl.....		50	2,807 176
W. Gushee.....		Pub. sch.	Gen.....	R. S.	4		442 177
		Pub. sch.	Tax. St..	F.....		100	900 178
Irvin C. Plass.....		Mem.....	St. Fees..	F.....	9	95	859 179
A. Lincoln Travis.....		Sch.....	St. Gen..	Fl.....		147	1,607 180

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
136	1850	1940	193	5	30			
137	1		1300	170				
138			310		54	\$120		\$200
139			300		172			
140	11,427	972	296	36	82			200
141	12,169	1	154	6	6		\$150	180
142	10,978	1	1.6	12	12	12 48		103 05
143			200	136			75	
144	1,500		156	3			25	25
145	1,194		336	5			100	100
146	45	26	200	30	30			
147								
148	2,400	1100	104	18	18			
149	275	1	40	1			30	
150	11,800	12,000	200	3	25			
151	467	764	191	1	35		4 47	4 33
152		1	200		30			
153	4690		313	42	42		500	200
154								
155			200	25				
156	139	20	40	2			25	25
157								
158	1500	1	52	5	5			
159		1	200	1				
160	12600		1200	1	1		25	25
161	815	900	191	2	25		25	50
162	1100	1800	200	30	30		76 20	76 20
163	14,286		323	18			800	200
164	1	1	1240		16			
165	14,500		40	1			191 14	191 15
166								
167	9026		313	27	27			
168	313	150	40	1		8 50		
169	408	1	200					31
170	300	175	226	30			65	32 50
171								
172	1254	125	250	5	30		75	75
173	12,000		188	5	15		742 44	199 61
174	786		39	1			35	35
175	1	1	40	1	1			
176			200	1	30		20 88	
177		1	192	30	30			
178	200	400	100	4			50	50
179	2647		313	8	72			74 94
180	136		74	4				80

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	.....	.....	\$36	.....	.....	\$36	136
.....	.....	.....	3 14	.....	.....	3 14	137
.....	.....	\$320	660 61	\$780	.....	1,440 61	138
.....	\$253 51	253 51	253 51	.....	.....	253 51	139
.....	1,016 37	1,216 37	601 72	500	\$114 65	1,216 37	140
.....
.....	115 77	445 77	364 27	.....	81 50	445 77	141
\$56	434 31	605 84	222 30	72 10	332 18	626 58	142
.....	.....	75	118 58	.....	.....	118 58	143
.....	13 50	63 50	50	10	3 50	63 50	144
.....	50	250	198 46	50	.....	248 46	145
.....
.....	.....	.....	.....	.....	.....	.....	146
85	34	119	.....	80	39	119	147
.....	30	60	60	.....	.....	60	148
.....	.....	.....	.....	.....	.....	.....	149
.....	.....	.....	.....	.....	.....	.....	150
.....	.....	8 80	8 80	.....	.....	8 80	151
.....	.....	.....	.....	.....	26	26	152
121	.....	821	175 07	162	164 48	501 55	153
.....	.....	.....	.....	.....	.....	.....	154
.....	.....	.....	.....	.....	.....	.....	155
.....	.....	50	.....	.....	.....	.....	156
.....	.....	.....	.....	.....	.....	.....	157
.....	16 30	16 30	4	12 30	.....	16 30	158
.....	.....	.....	.....	.....	.....	.....	159
.....	.....	50	50	.....	.....	50	160
.....
.....	25	100	100	.....	.....	100	161
.....	.....	152 40	152 40	.....	.....	152 40	162
.....	15	1015	421 78	260	333 22	1015	163
.....	95	95	95	.....	.....	95	164
.....	.....	182 29	182 29	.....	.....	182 29	165
.....
.....	639 72	639 72	207 26	231 75	200 71	639 72	166
.....	.....	8 50	8 50	.....	.....	8 50	167
.....	44 12	75 12	61 27	.....	.....	61 27	168
.....	.....	97 50	97 50	.....	.....	97 50	169
.....	.....	.....	.....	.....	.....	.....	170
.....
.....	24 70	174 70	171 47	.....	3 23	174 70	171
.....	.....	942 05	464 30	450	27 75	943 05	172
.....	65	70 65	70 65	.....	.....	70 65	173
.....	.....	.....	.....	.....	.....	.....	174
.....	.....	.....	.....	.....	.....	.....	175
.....	.....	20 88	20 88	.....	.....	20 88	176
.....	.....	.....	.....	.....	.....	.....	177
.....	.....	100	93 41	.....	.....	93 41	178
54	334 20	463 14	148 04	36 81	202 83	387 68	179
.....	80 65	160 65	160 65	.....	.....	160 65	180

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
181	Clayville.....	Union sch. lib.....	1876	I	i
182	Cleveland.....	Union sch. lib.....	1886	I	i
183	Clifton Springs.....	Union and class. sch. lib.....	1894	I	i
184	Clinton.....	Hamilton coll. lib.....	1812	I	ir
185	".....	Houghton sem. lib.....	1861	I	i
186	".....	Union sch. lib.....	1894	I	i
187	Clyde.....	High sch. lib.....	1834	I	i
188	Cobleskill.....	High sch. lib.....	?	I	i
189	Cohoes.....	City lib.....	1856		...
190	".....	Egbert's high sch. lib.....	1880	I	i
191	".....	St Bernard's acad. lib.....	1890	I	i
192	".....	Y. M. C. A. lib.....	1884	I	...
193	Cold Spring.....	Haldane union sch. lib.....	1892	I	i
194	College Point.....	Conrad Poppenhusen ass'n lib.....	1868	I	i
195	Cooperstown.....	Union sch. lib.....	.....	I	i
196	Copenhagen.....	Union sch. lib.....	1888	I	i
197	Corinth.....	Union sch. lib.....	1891	I	i
198	Corning.....	Corning free acad. lib.....	?	I	...
199	".....	Corning lib. ass'n.....	1873	G	...
200	".....	Union sch. lib.....	1896	I	i
201	Cornwall.....	Cornwall pub. lib.....	1896	R	c
202	Cornwall-on-Hudson...	Cornwall-on-Hudson pub. lib.....	1896	R	c
203	".....	N. Y. mil. acad. lib.....	1889	I	i
204	".....	Union sch. lib.....	1840	I	i
205	Corona.....	Union sch. lib.....	.....	I	i
206	Cortland.....	Franklin Hatch lib. ass'n.....	1886	G	...
207	".....	Union sch. lib.....	1894	I	i
208	Coxsackie.....	Union sch. lib.....	1837	I	i
209	Crown Point.....	Crown Point chapel lib.....	1884	R	c
210	".....	Union sch. lib.....	1879	I	i
211	Cuba.....	Union sch. lib.....	?	I	i
212	Dansville.....	Dansville pub. lib.....	1893	R	c
213	Delevan.....	Union sch. lib.....	.....	I	i
214	Delhi.....	Delaware acad. lib.....	1820	I	i
215	Depew.....	Union sch. lib. dist. no. 7.....	1894	I	i
216	Deposit.....	Union sch. lib.....	1873	I	i
217	Dexter.....	Union sch. lib.....	1850	I	i
218	Dolgeville.....	Union sch. lib.....	?	I	i
219	Dryden.....	Southworth lib.....	1883	G	a
220	".....	Union sch. lib.....	1871	I	i
221	Dundee.....	Union sch. lib.....	.....	I	i
222	Dunkirk.....	Acad. sch. lib.....	?	I	i
223	".....	Dunkirk free lib. ass'n.....	1872	G	...
224	".....	Dunkirk sch. lib.....	1893	...	...
225	".....	St Mary's acad. lib.....	1861	...	...

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
Wesley J. Somers		Pub. sch.	Tax. St.	F			450 181
		Pub. sch.	Tax. St.	F		60	400 182
		Sch.	Tax.	Fl			350 183
Melvin G. Dodge		Coll.	St. Gen.	F	415	480	34,762 184
		Sch.	St. Gen.	Fl			2,268 185
Lizzie Anderson		Pub. sch.	Tax. St.	F		313	1,557 186
Mary E. Ackerman		Pub. sch.	Tax. St.	Fl		57	1,747 187
W. H. Ryan		Pub. sch.	St. Gen.	F	53	160	626 188
R. A. Ross		Pub. sch.	Tax.	F			3,817 189
		Pub. sch.	Tax. St.	Fl			1,000 190
T. S. Keveny		Sch.	Gen.	Fl	14	6	734 191
E. H. Baldwin		Inst.	Gen.	Fl			350 192
Otis Montrose		Pub. sch.	Tax. St.	F		200	2,200 193
F. Martens		Inst.	Gen.	F	42	30	2,743 194
		Pub. sch.	Tax. St.	Fl			2,458 195
Fred A. Green		Pub. sch.	Tax. St.	F	50		750 196
A. M. Hollister		Pub. sch.	Tax. St.	F	61		602 197
Leigh R. Hunt		Pub. sch.	Tax.	Fl			1,083 198
Harry C. Heermans		Mem.		R. S.	150		7,000 199
Elizabeth E. Foster		Pub. sch.	Tax. St.	F	6	199	511 200
H. C. Woodworth		Pub. D.	Tax. St.	F		80	525 201
Leonora Pope		Pub. D.	Tax. St.	F	1	55	814 202
R. C. Jones		Sch.	Gen.	Fl	2,051	152	5,278 203
		Pub. sch.	Tax. St.	F			500 204
		Pub. sch.	Tax. St.	Fl			628 205
Mary E. Hubbard		Mem. end	Fees	S	50	93	3710 206
Eleanor E. Miller		Pub. sch.	Tax. St.	Fl		200	629 207
G. W. Fairgrieve		Pub. sch.	Tax. St.	F	5		670 208
Herminie Hammond		Pub. D.	Tax. St.	F	6	42	1077 209
		Pub. sch.	Tax.	Fl		7	341 210
J. E. Dewey		Pub. sch.	Tax. St.	Fl			400 211
Susie M. Parker		Pub. D.	Tax. St.	F	1	380	2930 212
		Pub. sch.	Tax. St.	Fl			439 213
Willis D. Graves		Sch.	St. G.	F	12		2298 214
		Pub. sch.	Tax.	Fl		61	1,366 215
G. W. Pye		Pub. sch.	Tax. St.	R. Fl		344	1913 216
Bart W. Alverson		Pub. sch.	Tax. St.	F		86	324 217
Ja. Eggenberger		Pub. sch.	Tax. St. G	Fl		316	1180 218
Cora B. Holden		End.	End.	F		207	5912 219
		Pub. sch.	Tax. St.	F		21	650 220
		Pub. sch.	Tax. St.	Fl			744 221
Nora J. Hayes		Pub. sch.	Tax. St.	Fl		45	1102 222
Jessie Underwood		Mem.	Fees	S	33	47	1815 223
J. W. Babcock		Pub. sch.	Tax. St.	Fl		177	1118 224
		Pri.	Pri.	Pri.	34	12	3000 225

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
181	400	.....	39	2	.....	.....	.....	\$22 50
182	392	.....	200	5	.....	.....	\$68 55	25
183	† 1500	.....	200	5	5	.....	.....	.....
184	3344	†	240	36	36	\$45	.....	200
185	.....	.....	.....	.....	.....	.....	.....	.....
186	† 8000	.....	48	2	.....	.....	199 17	149 89
187	4250	.....	194	.....	.....	.....	85	85
188	1200	.....	45	1	.....	.....	.....	224 12
189	16,256	3717	246	26	.....	.....	500	.....
190	.....	.....	.....	.....	.....	.....	.....	.....
191	413	.....	163	5	.....	.....	.....	.....
192	50	.....	313	.....	.....	.....	.....	.....
193	1484	250	220	10	10	.....	50	100
194	616	595	366	4	78	239 20	.....	.....
195	.....	.....	.....	.....	.....	.....	.....	.....
196	400	50	75	2	.....	.....	.....	.....
197	640	† 200	174	2	.....	.....	50	50
198	.....	† 4000	190	.....	50	.....	.....	.....
199	.....	.....	.....	.....	.....	.....	.....	.....
200	217	.....	200	10	15	.....	75	25
201	600	.....	156	3	3	.....	25	25
202	1221	.....	102	4	.....	.....	100	.....
203	† 4000	† 750	366	35	35	.....	.....	200
204	.....	.....	.....	.....	.....	.....	.....	.....
205	.....	.....	.....	.....	.....	.....	.....	.....
206	8,415	.....	308	61	61	400	.....	.....
207	.....	†	200	.....	.....	.....	100	100
208	630	.....	199	5	.....	.....	.....	.....
209	† 2,145	†	155	4	4	.....	.....	.....
210	.....	.....	195	.....	36	.....	12	.....
211	†	†	200	35	35	.....	.....	82 77
212	12,441	.....	208	12	.....	.....	500	175
213	.....	.....	.....	.....	.....	.....	.....	.....
214	847	632	70	†	†	.....	.....	.....
215	.....	.....	200	2	.....	.....	130	.....
216	† 1,000	.....	200	5	.....	.....	.....	.....
217	†	†	200	2	.....	.....	132 69	10
218	† 800	.....	40	1	.....	.....	100	25
219	† 5,000	.....	75	30	42	900	.....	.....
220	† 50	† 50	38	†	†	.....	.....	9 81
221	.....	.....	.....	.....	.....	.....	.....	.....
222	1,556	† 100	80	1	.....	.....	86 60	35
223	2,340	.....	102	6	.....	.....	.....	.....
224	† 4,000	†	† 200	1	† 25	.....	115 05	69 73
225	.....	.....	270	38†	15	.....	.....	.....

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	.....	\$22 50	.....	.....	.....	.....	181
.....	.....	93 55	\$93 55	.....	.....	\$93 55	182
.....	.....	.....	.....	.....	.....	.....	183
.....	\$1550	1795	1495	\$300	.....	1795	184
.....	.....	.....	.....	.....	.....	.....	185
\$7 87	.....	356 93	306 93	50	.....	356 93	186
.....	.....	170	.....	20	.....	20	187
.....	224 12	448 24	448 09	.....	.....	448 09	188
.....	.....	500	274 25	.....	.....	274 25	189
.....	.....	.....	.....	.....	.....	.....	190
.....	5 80	5 80	5 80	.....	.....	5 80	191
.....	.....	.....	.....	.....	.....	.....	192
.....	55	205	200	.....	\$5	205	193
.....	.....	239 20	125 70	84	29 50	239 20	194
.....	.....	.....	.....	.....	.....	.....	195
.....	50	50	.....	.....	.....	.....	196
.....	.....	100	4 34	.....	88 17	92 51	197
.....	.....	.....	.....	.....	.....	.....	198
.....	.....	100	87 50	.....	12 50	100	199
.....	.....	.....	.....	.....	.....	.....	200
.....	.....	50	52 25	10	3 60	65 85	201
.....	1 42	101 42	50 47	35	20	85 67	202
.....	150	350	260	.....	.....	260	203
.....	.....	.....	.....	.....	.....	.....	204
.....	.....	.....	.....	.....	.....	.....	205
286 72	80 75	767 47	108 47	450	125 75	684 22	206
.....	.....	200	186 48	.....	.....	186 48	207
.....	.....	.....	.....	.....	.....	.....	208
.....	17 16	17 16	38 40	.....	5 35	43 75	209
.....	.....	12	12	.....	.....	12	210
.....	.....	82 77	82 77	.....	.....	82 71	211
.....	41 95	716 95	406 63	98 29	92 70	597 62	212
.....	.....	.....	.....	.....	.....	.....	213
.....	.....	130	130	.....	45	175	214
.....	.....	.....	.....	.....	.....	.....	215
.....	223 16	223 16	223 16	.....	.....	223 16	216
.....	.....	142 69	142 69	.....	.....	142 69	217
.....	100	225	225	.....	.....	225	218
.....	.....	900	372	400	50	822	219
.....	13 15	22 96	11 55	.....	.....	11 55	220
.....	.....	.....	.....	.....	.....	.....	221
.....	.....	121 60	86 60	25	10	121 60	222
.....	143 67	143 67	75 42	48	.....	123 42	223
.....	.....	184 78	182 78	.....	2	184 78	224
.....	.....	.....	119 15	.....	.....	119 15	225

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
226	Dunkirk	St Mary's acad. sch. lib.....	1894	I	i
227	Earlville	Union sch. lib.....	1892	I	i
228	East Aurora	Union sch. lib.....	1883	I	i
229	East Bloomfield	Union sch. lib.....	1877	I	i
230	East Chatham	East Chatham pub. lib.....	1893	R	c
231	East Pembroke	Union sch. lib.....	1893	I	i
232	East Springfield	East Springfield acad. lib.....	.....	I	i
233	East Syracuse	Union sch. lib.....	.....	I	i
234	Easton	Easton lib. ass'n.....	1894	G	a
235	Eddytown	Starkey sem. lib.....	1842	I	i
236	Edmeston	Union sch. lib.....	.....	I	i
237	Elbridge	Munro col. inst. lib.....	1839	I	i
238	Elizabethtown	Elizabethtown lib. ass'n.....	1884	G	a
239	"	High sch. lib.....	1867	I	i
240	Ellenville	Ellenville pub. lib.....	1893	R	c
241	Ellicottville	Union sch. Harmon lib.....	1889	I	i
242	Ellington	Union sch. lib.....	1871	I	i
243	Elmira	D. L. and W. R. R. Y. M. C. A. lib.	1881	I	...
244	"	Elmira farmers club lib.....	1872	L	...
245	"	Elmira free acad. lib.....	1840	I	i
246	"	N. Y. state reformatory lib.....	1876	I	...
247	"	Y. M. C. A. lib.....	1858	I	...
248	"	Y. M. C. A. R. R. branch lib.....	1881	...	...
249	Fair Haven	Union sch. lib.....	1890	I	i
250	Fairfield	Fairfield sem. lib.....	1803	I	i
251	Fairport	Fairport pub. lib.....	1895	R	c
252	"	Union sch. lib.....	1870	I	i
253	Far Rockaway	Union sch. lib.....	1890	I	i
254	Fayetteville	Union sch. lib.....	?	I	i
255	Fishkill	Union sch. lib.....	1894	I	i
256	Florida	S. S. Seward inst. lib.....	1847	I	i
257	Flushing	Flushing inst. lib.....	?	I	i
258	"	Flushing lib. ass'n.....	1859	G	r
259	"	High sch. lib.....	?	I	i
260	"	St Joseph's acad. lib.....	1869	I	i
261	Fonda	Union sch. lib.....	1887	I	i
262	Forestville	Forestville free acad. lib.....	1867	I	i
263	Fort Ann	Union sch. lib.....	1895	I	i
264	Fort Covington	Fort Covington free acad. lib.....	?	I	i
265	Fort Edward	Fort Edward col. inst. lib.....	1854	I	i
266	"	Union sch. lib.....	1870	I	i
267	Fort Hamilton	Fort Hamilton free lib.....	1893	R	c
268	Fort Plain	Clinton liberal inst. lib.....	1834	I	i
269	"	Fort Plain free lib.....	1885	R	c
270	"	Union sch. lib.....	?	I	i

LIBRARIES (continued)

Name of librarian or person in charge	Class of book if not general	Ownership or control	Support	Terms of use	VOLUMES		Total no. in library	
					NO. ADDED LAST YEAR			
					Given	Bought		
Casemer Taylor.....		Sch.....	Gen.....	Fl.....	8	36	396	226
		Pub. sch.	Tax. St.	F.....		18	477	227
E. Hambleton.....		Pub. sch.	Tax. St.	F.....	19	284	2247	228
D. B. Williams.....		Pub. sch.	Tax. St.	F.....			900	229
S. B. Smith.....		Pub. D.....	Tax. St.	F.....		150	788	230
J. W. Currie.....		Pub. sch.	Tax. St.	F.....	16	96	1700	231
J. T. P. Calkins.....		Sch.....	Tax. St.	Fl.....	12		299	232
Clara B. Wheeler....		Pub. sch.	Tax. St.	Fl.....	2	80	1603	233
Mary Stiles.....		Mem.....	Tax. St. G	F.....	1	48	693	234
F. W. Smith.....		Sch.....	St. G.....	F.....	100		3100	235
		Pub. sch.	Tax.....	Fl.....			400	236
		Sch.....	End.....	F.....			1206	237
Elizabeth V. Hale...		Mem.....	St. G. Fees	F.....	43	102	1566	238
S. F. Herron.....		Pub. sch.	Tax. St.	R. Fl.		70	690	239
Retta L. Russell.....		Pub. D.....	Tax. St. G	F.....	28	39	1657	240
C. J. Melrose.....		Pub. sch.	Tax. St.	Fl.....	16	92	812	241
		Pub. sch.	Tax. St.	F.....		30	552	242
H. A. Leese.....		Inst.....	G. Fees...	Fl.....		100	993	243
M. B. Heller.....		Mem.....	Gen.....	Fl.....			1500	244
C. W. Evans.....		Pub. sch.	Tax. St.	Fl.....		89	2248	245
J. H. Molerial.....		Inst.....	Gen.....	Fl.....		350	4000	246
Rufus Stanley.....		Inst.....	Gen.....	Fl.....			2500	247
C. L. Shattuck.....		Inst.....	G. Gen...	Fl.....	6		443	248
G. A. Jacobs.....		Pub. sch.	Tax. St.	Fl.....			450	249
J. M. Hall.....		Sch.....	St. Gen...	Fl.....			3780	250
Mary E. Steele.....		Pub. D.....	Tax. St.	F.....	210	155	365	251
Mary E. Steele.....		Pub. sch.	Tax. St.	Fl.....	5	18	500	252
S. J. Ellsworth.....		Pub. sch.	Tax. St.	Fl.....	1	52	346	253
Frank J. House.....		Pub. sch.	Tax. St.	F.....			1662	254
		Pub. sch.	Tax. St.	R.....		10	335	255
E. F. Brown.....		Sch.....	Gen.....	Fl.....	70		809	256
E. A. Fairchild.....		Sch.....	Gen.....	Fl.....	25		1360	257
Eleanor Vanderhoef		Mem.....	End. G...	F.....	170	132	6250	258
Jean Ely.....		Pub. sch.	Tax. St.	Fl.....	200		2890	259
Sister M. DePaul...		Sch.....	St. Gen...	Fl.....	39	45	1260	260
C. A. Coons.....		Pub. sch.	Tax. St.	F.....		157	1328	261
Virginia Hillebert..		Pub. sch.	Tax. St.	F.....	25		925	262
		Pub. sch.	St. G.....	F.....	5	212	370	263
Veda M. Lyon.....		Pub. sch.	Tax. St.	Fl.....			554	264
		Sch.....	St. G.....	Fl.....			850	265
Helen F. Young.....		Pub. sch.	Tax. St.	F.....		565	1865	266
Callie Mayo.....		Mem.....	St. G.....	F.....	576	702	3401	267
Kittie Clover.....		Sch.....	G. Gen...	R. Fl.	56		3564	268
Maria Ehle.....		Mem.....	St. G.....	F.....		45	1070	269
R. H. Bellows.....		Pub. sch.	Tax. St.	F.....		50	724	270

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
226	?	?	270	381	15	.....	.....	.....
227	1,815	50	32	1	30	.....	\$10	\$10
228	11,001	?	215	7	7	.....	150	150
229	800	?	52	1	.....	.....	.....	.....
230	1,339	1400	200	25	5	.....	75	75
231	11,500	.....	40	1	.....	.....	25	44 24
232	63	18	185	5	.....	.....	.....	.....
233	1,325	392	200	1	35	.....	50	75
234	1,247	.....	156	3	3	.....	.....	.....
235	14,000	15,000	303	12	14	.....	.....	.....
236	.....	.....	.....	.....	.....	.....	.....	.....
237	.....	.....	.....	.....	.....	.....	.....	.....
238	3,051	?	104	6	6	.....	.....	.....
239	.....	.....	200	.....	35	.....	57 42	97 58
240	17,143	.....	306	24	.....	.....	400	.....
241	12,000	.....	40	1	.....	.....	50	100
242	.....	293	189	5	.....	.....	11 55	13 13
243	1,942	.....	313	72	.....	.....	.....	.....
244	.....	.....	52	8	.....	.....	.....	.....
245	?	.....	177	15	.....	.....	50	50
246	157,200	.....	309	.....	.....	.....	.....	.....
247	.....	.....	.....	.....	.....	.....	.....	.....
248	24	.....	313	78	78	.....	.....	.....
249	.....	.....	200	.....	30	.....	.....	.....
250	800	1,200	259	7	42	.....	.....	.....
251	1514	.....	140	3	.....	.....	100	100
252	11,140	.....	191	4	.....	.....	15	10
253	135	.....	50	1	.....	.....	25	25
254	705	.....	50	1	.....	.....	.....	.....
255	.....	?	200	.....	.....	.....	44 44	20 06
256	200	.....	1200	16	.....	.....	.....	.....
257	?	.....	177	?	.....	.....	.....	.....
258	12,237	.....	300	18	18	.....	.....	100
259	?	?	180	5	26	.....	.....	.....
260	.....	.....	72	2	25	.....	.....	1 75
261	1 1600	1 500	40	3	39	.....	104	104
262	1352	.....	96	2	.....	.....	.....	.....
263	537	.....	182	2	.....	.....	.....	14 70
264	300	.....	183	21	.....	.....	.....	25
265	.....	.....	.....	.....	.....	.....	.....	.....
266	5000	150	75	21	.....	.....	.....	100
267	8258	.....	120	16	16	.....	.....	200
268	673	?	188	26	26	.....	.....	.....
269	5699	.....	156	9	.....	.....	.....	25
270	415	.....	56	2	.....	.....	91 91	25

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	.....	.....	\$22	.....	.....	\$22	226
.....	.....	\$20	20	.....	.....	20	227
.....	.....	300	229	.....	.....	229	228
.....	.....	.....	16 25	.....	.....	16 25	229
.....	.....	150	148 69	.....	\$1 58	150 27	230
.....
.....	.....	69 24	83 08	.....	1 44	84 52	231
.....	\$12	12	.....	.....	.....	.....	232
.....	.....	125	123	\$25	.....	148	233
.....	53 19	53 19	49 43	25	25 93	100 36	234
.....	45	45	25	20	.....	45	235
.....	.....	.....	.....	.....	.....	.....	236
.....	.....	.....	.....	.....	.....	.....	237
\$45 41	34 07	79 48	144 95	.....	52	196 95	238
.....	.....	155	155	.....	.....	155	239
.....	27 96	427 96	71 37	200	203 04	474 41	240
.....	.....	150	150	.....	.....	150	241
.....	.....	24 68	.....	.....	.....	.....	242
.....	.....	.....	.....	.....	.....	.....	243
.....	.....	.....	.....	.....	.....	.....	244
.....	.....	100	215 12	.....	.....	215 12	245
.....	200	200	200	.....	.....	200	246
.....	.....	.....	.....	.....	.....	.....	247
.....	.....	.....	.....	.....	.....	.....	248
.....	.....	.....	.....	.....	.....	.....	249
.....	.....	.....	.....	.....	.....	.....	250
.....	.....	200	141 11	12	5 06	158 17	251
.....	.....	25	25	.....	.....	25	252
.....	96 17	146 17	56	.....	.....	56	253
.....	.....	.....	5 70	.....	.....	5 70	254
.....	.....	64 50	64 50	.....	.....	64 50	255
.....	.....	.....	.....	.....	.....	.....	256
.....	625 25	725 25	100	279 50	327 07	706 57	257
.....	.....	.....	.....	.....	.....	.....	258
12	115	202	40	.....	.....	40	259
.....	.....	.....	.....	.....	.....	.....	260
.....	.....	208	208	.....	.....	208	261
.....	.....	.....	.....	.....	.....	.....	262
.....	25	39 70	163 21	.....	4 69	167 90	263
.....	.....	25	.....	.....	.....	.....	264
.....	.....	.....	.....	.....	.....	.....	265
71 42	.....	171 42	126	25	.....	151	266
.....	290 75	490 75	400	116	23 10	539 10	267
9 35	50	59 35	55	75	.....	130	268
.....	120	145	58 95	.....	163 94	222 89	269
.....	33 09	150	150	.....	.....	150	270

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
271	Frankfort	Union sch. lib.	1888	I	i
272	Franklin	Delaware lit. inst. lib.	1835	I	i
273	Franklinville	Ten Broeck free acad. lib.	1867	I	i
274	Fredonia	Darwin R. Barker lib. ass'n	1875	L	r
275	"	State normal sch. lib.		I	
276	Freeport	Freeport pub. lib.	1895	R	c
277	Friendship	High sch. lib.	1890	I	i
278	Fulton	Union sch. lib.		I	i
279	Fultonville	Union sch. lib.	1891	I	i
280	Gainesville	Union sch. lib.	1885	I	i
281	Garden City	St Paul's sch. lib.	1882		
282	Garrison	Garrison free reading room.	1885		
283	Geneseo	State normal sch. lib.		I	
284	Geneva	De Lancey sch. lib.	1868	I	i
285	"	Geneva classical and un. sch. lib.	1839	I	i
286	"	Hobart coll. lib.	1825	I	i
287	Gilbertsville	Gilbertsville free lib.	1889	G	a
288	"	Union sch. lib.	1895	I	i
289	Glen Cove	Glen Cove pub. lib.	1894	R	c
290	Glen Haven	Glen Haven pub. lib.	1893	R	c
291	Glens Falls	Crandall free lib.	1893	R	c
292	"	Glens Falls acad. lib.	1841	I	i
293	Gloveraville	Gloveraville free lib.	1880	GL	r
294	"	High sch. lib.	?	I	i
295	Goshen	Union sch. lib.	1889	I	i
296	Gouverneur	High sch. lib.	1828	I	i
297	"	Reading room ass'n	1885	G	
298	Gowanda	Union sch. lib.	1863	I	i
299	Granville	Union sch. lib.	1891	I	i
300	Great Neck	Union sch. lib. dist. no. 7, N. Hempst'd	?	I	i
301	Greenbush	St John's acad. sch. lib.	1895	I	i
302	Greene	Union sch. lib.	1860	I	i
303	Greenport	Union sch. lib.		I	i
304	Greenville	Greenville acad. lib.	1816	I	i
305	Greenwich	Union sch. lib.	1877	I	i
306	Groton	Groton pub. lib.	1896	R	c
307	Hamburg	Union sch. lib.	1847	I	i
308	Hamilton	Beta Theta Pi soc. lib.	1846		
309	"	Colgate acad. lib.	1873	I	i
310	"	Colgate univ. lib.	1820	I	i
311	"	Union sch. lib.	1893	I	i
312	Hammondsport	Union sch. lib.		I	i
313	Hancock	Union sch. lib.	1863	I	i
314	Hartwick Seminary	Hartwick sem. lib.	1816	I	i
315	"	Hartwick sem. theo. dep't lib.		I	i

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no in library
					Given	Bought	
S. J. Slawson.....		Pub. sch.	Tax. St.	Fl ..		70	700 271
J. H. Lawrence.....		Sch	St. G ..	F			1861 272
Hamilton Terry.....		Pub. sch.	Tax	Fl	10	1	† 1400 273
Mrs L. B. Greene.....		Mem	E. Tax. St.	F	103	347	4343 274
F. N. Jewett		Sch	Gen	Fl		49	† 2000 275
C. W. Oley		Pnb. D ..	St. G	F	223	536	759 276
T. H. Armstrong.....		Pub. sch.	Tax. St.	F		19	827 277
		Pub. sch.	Tax. St.	Fl			361 278
Hewart Bolton.....		Pub. sch.	Tax. St.	F	6		577 279
S. L. Strivings		Pub. sch.	Tax. St.	F		20	324 280
		Sch	Gen	Fl			1100 281
Ja. H. Dibbell.....		Pri	Pri	F			1000 282
J. M. Milne		Sch	Gen	Fl			289 283
Mary S. Smart.....		Sch	Gen	Fl		20	585 284
W. H. Truesdale.....		Pub. sch.	Tax. St.	F	13	476	4643 285
C. D. Vail		Coll	End. Gen.	R. Sl.	586	803	32,806 286
Mrs Carrie Cloud.....		Mem	End. St.	F			1094 287
B. C. Van Ingen.....		Pub. sch.	Tax. St.	Fl		75	† 1000 288
Carolyn S. Reed.....		Pub. D ..	Tax. St.	F	26	390	1572 289
Velma A. Cochran.....		Pub. D ..	St. G	F	46	121	727 290
Annie DeLong.....		End	E. Tax. St.	F	10	289	7559 291
		Sch	St. G	R. Fl ..		164	5059 292
A. L. Peck		Mem Pub	E. Sdy. St.	F	152	1053	13,670 293
Mary E. Phillips.....		Pub. sch.	Tax. St.	Fl		78	761 294
J. T. Tracy		Pub. sch.	Tax. St.	Fl		125	1184 295
J. C. Bliss		Pnb. sch.	Tax. St.	R. Fl ..		244	1043 296
Jessie E. Paul.....		Mem	G. Fees ..	R. S ..		74	1392 297
C. A. Black		Pub. sch.	Tax. St.	Fl		3	700 298
R. E. Brown.....		Pub. sch.	Tax. St.	R. Fl ..	10	62	611 299
Ja. W. Jacobus.....		Pub. sch.	Tax	F		68	567 300
		Sch	Gen	Fl	100	42	500 301
W. N. Harris		Pub. sch.	Tax. St.	F		9	1309 302
		Pub. sch.	Tax. St.	Fl			1304 303
		Sch	Gen	F		2	507 304
G. E. Dorr		Pub. sch.	St. Fees ..	S			1669 305
Mrs L. M. Tanner		Pub. D ..	Tax. St.	F	11		550 306
B. H. Heath		Pub. sch.	Tax. St.	F		82	1348 307
Thomas Allen.....		Mem	Fees	Fl		15	975 308
F. H. Howard.....		Sch	Gen	Fl	1	27	† 2000 309
R. W. Thomas.....		Coll	End. G ..	Fl	586	352	24,757 310
C. H. Van Tuyl.....		Pub. sch.	Tax. St.	F		50	850 311
		Pub. sch.	Tax. St.	Fl		196	600 312
L. R. Long		Pub. sch.	Tax. St.	Fl			397 313
J. L. Kistler.....		Sch	End. Gen	Fl	35	2	5532 314
		Coll	Gen	Fl			3000 315

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
271	† 600	.....	200	2	30	.....	\$50	\$23 65
272	500	200	180	5	5	.....	.....	.....
273	† 100	† 300	200	1	20	.....	.....	.....
274	5094	.....	160	22½	22½	\$78 71	75	200
275	.....	.....	.....	.....	.....	.....	.....	.....
276	1174	.....	30	3	..	.....	.....	200
277	2000	.....	180	2	50	.....	23	23
278	.....	.....	.....	.....	.....	.....	.....	.....
279	† 325	† 1200	† 200	1	6	.....	.....	.....
280	185	110	200	10	15	.....	25	25
281	300	.....	252	21	84	.....	.....	.....
282	.....	.....	250	35	35	.....	.....	.....
283	.....	.....	200	.....	25	.....	.....	.....
284	.....	.....	170	30	30	.....	.....	.....
285	8287	12,125	212	36½	11	.....	635	315
286	3054	†	313	24	24	1025	.....	.....
287	3400	.....	358	43	43	131 50	.....	100
288	.....	.....	200	.....	.....	.....	.....	40
289	2226	.....	147	3	.....	.....	300	200
290	1326	.....	210	2	.....	.....	.....	120
291	34,263	†	300	54	54	.....	500	200
292	.....	.....	.....	.....	.....	.....	.....	100
293	62,368	5391	308	72	72	443 86	2000	200
294	.....	†	196	.....	30	.....	24 52	24 51
295	230	† 200	40	½	.....	.....	50	75
296	†	†	190	30	30	.....	121 67	97 28
297	2714	872	304	33	36	.....	.....	.....
298	224	† 500	150	3	25	.....	3 50	.....
299	326	300	180	30	30	.....	50	50
300	540	†	195	5	30	.....	51 20	.....
301	.....	† 50	199	6½	.....	.....	.....	.....
302	† 600	.....	200	2	.....	.....	25	.....
303	.....	.....	.....	.....	.....	.....	.....	.....
304	† 100	.....	200	5	.....	.....	.....	.....
305	†	.....	52	1	1	.....	25	.....
306	† 1300	.....	200	10	.....	.....	25	.....
307	† 1200	†	184	30	30	.....	25	25
308	.....	.....	200	30	30	.....	.....	.....
309	.....	.....	240	9	9	.....	.....	.....
310	2617	3351	245	50	50	1250	.....	.....
311	1931	† 2300	261	5	30	.....	33	.....
312	† 150	† 500	190	6	6	.....	50	75
313	126	.....	189	1	25	.....	.....	.....
314	† 400	.....	200	† 4	30	10	.....	.....
315	.....	.....	.....	.....	.....	.....	.....	.....

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	.....	\$73 65	\$61 54	.....	.....	\$61 54	271
.....	.....	.....	7	.....	.....	7	272
\$239 85	\$520 60	1114 16	331 85	\$174 65	\$105 28	611 78	273
.....	.....	.....	.....	.....	.....	.....	274
.....	.....	.....	.....	.....	.....	.....	275
.....	318 14	518 14	371 11	.....	34 27	405 38	276
.....	3	49	49	.....	.....	49	277
.....	.....	.....	.....	.....	.....	.....	278
.....	.....	.....	9 40	.....	.....	9 40	279
.....	.....	50	50	.....	.....	50	280
.....	.....	.....	.....	.....	.....	.....	281
.....	.....	.....	.....	.....	.....	.....	282
.....	.....	.....	.....	.....	.....	.....	283
.....	.....	.....	20	.....	.....	20	284
.....	16 30	966 30	575 48	320	70 82	966 30	285
272	35,100	36,397	665 10	1292 90	17,324	19,282	286
2	239 97	473 47	22 09	204	132 28	358 37	287
.....	40	80	80	.....	.....	80	288
.....	43 95	543 95	388 46	13	99 95	501 41	289
.....	133 69	253 69	115 40	15	60 17	190 57	290
.....
.....	1008	1708	764 47	407 75	207 83	1380 05	291
.....	100	200	200	.....	.....	200	292
.....	11,890 42	14,534 28	1228 33	2445 70	9007 46	12,681 49	293
.....	.....	49 03	49 03	.....	.....	49 03	294
.....	.....	125	118 97	.....	.....	118 97	295
.....	.....	218 95	218 95	.....	.....	218 95	296
26 25	592 91	919 16	132 06	214	431	770 06	297
.....	.....	8 50	3 50	.....	.....	3 50	298
.....	.....	100	69 54	.....	.....	69 54	299
.....	.....	51 20	51 20	.....	.....	51 20	300
.....
.....	300	300	45	.....	.....	45	301
.....	.....	25	25	.....	.....	25	302
.....	.....	.....	.....	.....	.....	.....	303
.....	.....	.....	.....	.....	.....	.....	304
15 30	4 50	44 80	31 20	.....	.....	31 20	305
.....	.....	25	.....	.....	.....	.....	306
.....	.....	50	51 65	.....	.....	51 65	307
.....	.....	.....	.....	.....	.....	.....	308
.....	.....	.....	.....	.....	.....	.....	309
.....	1200	2450	1235 89	1236	.....	2471 89	310
.....	.....	33	33	.....	.....	33	311
.....	.....	125	124 81	.....	.....	124 81	312
.....	25	25	25	.....	.....	25	313
.....	5 10	15 10	6 50	10	50	17	314
.....	.....	.....	.....	.....	.....	.....	315

NEW YORK

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
316	Haverstraw.....	King's daughters' pub. lib.....	1895	R	c
317	Herkimer.....	Herkimer free lib.....	1896	R	c
318	Highland.....	Union sch. lib.....	1894	I	i
319	Highland Falls.....	Morgan circ. lib.....	1884	I	...
320	Hinsdale.....	Union sch. lib.....	1892	I	i
321	Hobart.....	Union sch. lib.....	1893	I	i
322	Hogansburg.....	Hogansburg acad. lib.....	1889	I	i
323	Holland Patent.....	Union sch. lib.....	1800	I	i
324	Holley.....	Union sch. lib.....	1847	I	i
325	Homer.....	Homer acad. lib.....	1819	I	i
326	Honeoye.....	Union sch. lib.....	1893	I	i
327	Honeoye Falls.....	Union sch. lib.....	1892	I	i
328	Hoosick Falls.....	Union sch. lib.....	?	I	i
329	Hornellville.....	Hornell free acad. lib.....	1885	I	i
330	".....	Hornell free lib.....	1868	G	a
331	".....	St Ann's acad. sch. lib.....	1894	I	i
332	".....	Y. M. C. A. R. R. branch lib.....	1879	I	...
333	Horseheads.....	Union sch. lib.....	1884	I	i
334	Hudson.....	High sch. lib.....	.....	I	i
335	".....	Y. M. C. A. lib.....	1867	I	...
336	Hunter.....	Hunter pub. lib.....	1896	R	c
337	Huntington.....	Huntington pub. lib.....	1875	G	...
338	".....	Union sch. lib.....	1858	I	i
339	Ilion.....	Ilion dist. lib.....	1893	R	c
340	".....	Ilion free pub. lib.....	1893	L	...
341	".....	Union sch. lib.....	.....	I	i
342	Irvington.....	Union sch. lib.....	.....	I	i
343	Islip.....	Islip lib. ass'n.....	1884	I	...
344	".....	Sch. lib. dist. no. 12.....	1882	I	...
345	".....	Union sch. lib.....	1894	I	i
346	Ithaca.....	Cascadilla sch. lib.....	1893	I	i
347	".....	Cornell lib. ass'n.....	.....	L	...
348	".....	Cornell univ. lib.....	1868	I	i
349	".....	Cornell univ. law lib.....	1888	I	i
349	".....	High sch. ref. lib.....	1875	I	i
350	Jamaica.....	Union sch. lib.....	1889	I	i
351	Jamestown.....	High sch. lib.....	1868	I	i
352	".....	James Prendergast free lib.....	1880	L	a
353	".....	Y. M. C. A. lib.....	1884	I	r
354	Johnstown.....	Union sch. lib.....	1869	I	i
355	Jordan.....	Jordan free acad. lib.....	.....	I	i
356	Jordanville.....	Jordanville pub. lib.....	1893	R	c
357	Joshua's Rock.....	Mountainside free lib.....	1894	R	c
358	Keene Valley.....	Keene Valley pub. lib.....	1891	R	c
359	Keeseville.....	McAuley acad. lib.....	1891	I	i
360	".....	Union sch. lib.....	?	I	i

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if no general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
Mary E. Van Orden	Mem	St. Gen.	F	1031	119	1150
Mary L. Avery	End.	Tax. St.	F	3889	730	4619
A. D. Lent	Pub. sch.	Tax. St.	F	2	30	650
A. B. Rundell	End.	End.	F	12	20	1282
Eibel Ross	Pub. sch.	Tax. St.	F	.....	8	500
Janet J. Campbell	Pub. sch.	Tax. St.	F	7	.....	530
M. Cecelia Hodnett	Sch.	G.	Fl	30	60	1198
H. A. Pride	Pub. sch.	Tax. St.	F	.....	.....	1000
J. A. Cowles	Pub. sch.	St.	F	1	76	831
.....	Pub. sch.	End. St.	F	.....	5	1200
L. A. Toepp	Pub. sch.	Tax. St.	Fl	.....	10	324
C. F. Walker	Pub. sch.	Tax. St.	Fl	.....	161	775
E. G. Merritt	Pub. sch.	Tax. St.	F	.....	106	2118
W. R. Prentice	Pub. sch.	Tax. St.	F	.....	304	2600
Mary E. Windsor	End.	Tax. St.	F	26	470	110,000
St. M. Xavier Galvin	Sch.	Gen.	Fl	.....	56	802
L. L. Simons	Inst.	G. Gen.	Fl	.....	.....	600
.....	Pub. sch.	Tax. St.	F	.....	258	808
.....	Pub. sch.	Tax. St.	F	.....	.....	5050
H. W. Rice	Inst.	Gen.	R. Fl	100	.....	1300
Jennie A. Armstrong	Pub. D.	Tax. St.	F	227	62	391
A. S. Conklin	Mem	Fees	R. S.	228	280	23537
C. J. Jennings	Pub. sch.	Tax. St.	F	.....	109	1190
Anna H. Perkins	Pub. D.	St. G.	F	.....	47	1010
Anna H. Perkins	Pub.	End. Tax	F	172	38	7752
.....	Pub. sch.	Tax. St.	F	.....	.....	350
Alice S. Cavarly	Pub. sch.	Tax. St.	F	.....	.....	2195
Ella S. Clock	Mem	Fees	S.	92	85	1039
W. A. Codman	Pub. sch.	Tax. St.	F	5	54	893
M. I. Hunt	Pub. sch.	Tax. St.	Fl	.....	116	293
.....	Sch.	Gen.	Fl	32	.....	458
S. H. Synnott	End.	End.	F	627	6207	618,697
G. W. Harris	Coll.	End. Gen.	R. Fl	3565	10,013	186,683
.....	Law.	Coll.	Gen.	R.	.....	688	24,270
H. W. Foster	Pub. sch.	Tax. St.	Fl	.....	130	796
.....	Pub. sch.	Tax. St.	F	.....	1	2521
Calista S. Jones	Pub. sch.	Tax. St.	F	7	264	3304
M. E. Hazeltine	End.	End. St.	F	2040	483	12,567
C. N. Ramsey	Inst.	St. Gen.	F	75	80	1433
W. S. Snyder	Pub. sch.	Tax. St.	F	30	943	7442
.....	Pub. sch.	Tax. St.	F	.....	.....	1239
Elizabeth A. Bell	Pub.	St. G.	F	2	100	771
Mrs Esther Coffin	Mem	St. G.	F	11	94	443
Grace E. Perry	Mem	St. G.	F	25	85	980
M. J. Carr	Sch.	Gen.	Fl	6	13	600
Emily L. Hallock	Pub. sch.	Tax. St.	F	.....	.....	1500

a For year ending Dec. 31, 1895. b For year ending Dec. 20, 1895.

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
316	3583	-----	40	13	-----	-----	\$200	
317	10,065	----- ?	154	42	42	-----	200	
318	-----	-----	40	1	-----	\$15	15	
319	3675	56	147	15	15	-----	-----	
320	-----	517	52	1	-----	25	23 72	
321	318	-----	10	1	-----	-----	-----	
322	-----	700	204	-----	10	-----	-----	
323	-----	?	52	2	2	25	17	
324	1050	-----	40	1	-----	-----	33 35	
325	4000	-----	90	3	-----	\$40	-----	
326	100	?	180	2	30	-----	100	
327	?	-----	200	5	5	33 26	66	
328	2496	-----	115	5	-----	83	83	
329	1500	2500	200	25	30	-----	-----	
330	33,811	?	309	36	36	1500	200	
331	200	78	251	6	30	-----	-----	
332	182	150	313	78	78	-----	-----	
333	1550	?	200	2	16	125	125	
334	-----	-----	-----	-----	-----	-----	-----	
335	1250	150	313	60	60	-----	-----	
336	-----	-----	129	1	25	-----	84	
337	3124	?	306	36	36	-----	-----	
338	-----	?	188	6	6	-----	-----	
339	5032	?	309	51	54	-----	-----	
340	35,444	?	309	51	54	215	1750	
341	-----	-----	-----	-----	-----	-----	-----	
342	1090	-----	73	4	-----	125	75	
343	1200	-----	100	2	-----	-----	-----	
344	891	-----	45	1	-----	25 52	8 84	
345	40	1500	200	40	40	78 74	75	
346	?	-----	?	-----	-----	-----	-----	
347	34,038	?	300	36	72	-----	-----	
348	15,288	77,282	310	76½	76½	21,892	-----	
	-----	-----	312	-----	14½	-----	-----	
349	-----	4000	193	-----	40	121 32	121 32	
350	-----	51	209	15	-----	100	100	
351	9725	10,578	187	30	30	1150	200	
352	51,946	6000	279	58	58	5108	200	
353	277	1500	260	78	78	-----	200	
354	7263	5400	200	35	35	309 09	200	
355	-----	-----	-----	-----	-----	-----	-----	
356	2254	-----	150	4	-----	-----	55	
357	1000	-----	280	90	-----	-----	-----	
358	1560	-----	147	10	10	-----	50	
359	-----	3000	175	-----	48	-----	-----	
360	1300	?	200	30	-----	80	-----	

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	\$261 37	\$1061 37	\$117 89	\$70	\$151 36	\$339 25	316
.....	1242 77	1442 77	914 66	234	329 34	1478	317
.....		30	30			30	318
.....			50	640	275	965	319
.....		48 72	35			35	320
.....			5 98			5 98	321
.....	30	30					322
.....		42	54 75			54 75	323
.....		33 35	54 56			54 56	324
.....		40					325
.....		100	10			10	326
.....	33	132 26	138 26		1	139 26	327
.....		166	166	90		256	328
.....				534 83	10	544 83	329
.....	97 35	1797 35	717 70	500	435 63	1653 33	330
.....	35 35	35 35	35 35			35 35	331
.....	2 26	2 26	9 90		1 75	11 65	332
.....		250	250		3	253	333
.....							334
.....							335
.....	\$10	360	350		8	358	336
.....	212 89	395 48	105 63	125	193 14	423 77	337
.....			37 61			37 61	338
.....			89 61		40 80	130 41	339
.....	118 57	2083 57	69 60	893 85	1098 47	2061 92	340
.....							341
.....		200	150	50		200	342
.....	38 25	229 95	54 48	15 50	116 07	186 05	343
.....		34 36	34 36			34 36	344
.....		153 74	153 74			153 74	345
.....							346
.....							347
.....	200	32,092	21,328 78	12,192	1450	34,970 78	348
.....	200	200	3078 78			3078 78	
.....		242 64	242 64			242 64	349
.....		200	99 04	120		219 04	350
.....	1 66	1351 66	536 64	550	263 93	1350 57	351
.....	530	5838	754 16	2460	1089 47	4303 63	352
.....	559 39	759 39	272 26	150	337 38	759 64	353
.....		509 09	351 24	100		451 24	354
.....							355
.....	56 92	111 92	109 02		2 17	111 19	356
.....	25	25	94 29	10		104 28	357
.....	636 36	686 36	102 92	52	540 70	695 62	358
.....	75	75	51		15	66	359
.....		30					360

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
361	Kenwood.....	Fem. acad. of the Sacred Heart lib.	1861	I	i
362	Kenka College.....	Kenka inst. lib.	1890	I	i
363	Kingston.....	Kingston free acad. lib.	?	I	i
364	Knowlesville.....	Union sch. lib.	1890	I	i
365	Lake George.....	Lake George free lib.	1895	R	c
366	" ".....	Union sch. lib.	1894	I	i
367	Lake Placid.....	Lake Placid pub. lib.	1884	R	c
368	Lancaster.....	Union sch. lib.	1894	I	i
369	Lansingburg.....	Lansingburg acad. lib.	1796	I	i
370	".....	Union sch. lib. dist. no. 1	?	?	?
371	Lawrence Station.....	Union sch. lib.	?	I	i
372	Le Roy.....	Le Roy lib. ass'n.	1874	G	?
373	".....	Union sch. lib.	1891	I	i
374	Leonardsville..	Leonardsville lib. ass'n	1883	?	?
375	Liberty.....	Liberty pub. lib.	1894	R	c
376	Lima.....	Genesee Wesleyan sem. lib.	1832	I	i
377	Limestone.....	Union sch. lib.	1878	I	i
378	Lisle.....	Union sch. lib.	1868	I	i
379	Littlefalls.....	Union sch. lib.	1845	I	i
380	Little Valley.....	Union sch. lib.	?	I	i
381	Liverpool.....	Liverpool pub. lib.	?	R	c
382	Livonia.....	Union sch. lib.	1892	I	i
383	Lockport.....	Lockport pub. lib.	1893	R	c
384	".....	St Joseph's acad. & ind. fem. sch. lib.	1866	I	i
385	".....	Union sch. lib.	?	I	i
386	Long Island City.....	Long Island City pub. lib.	1896	R	c
387	" " ".....	Union sch. lib.	?	I	i
388	Lowville.....	Lowville acad. lib.	1808	I	i
389	Lyndonville.....	Union sch. lib.	1889	I	i
390	Lyons.....	Union sch. lib.	1840	I	i
391	McGrawville.....	Union sch. lib.	?	I	i
392	Macedon.....	Union sch. lib.	1895	I	i
393	Madalin.....	Tivoli pub. lib.	1894	R	c
394	Madrid.....	Union sch. lib.	?	I	i
395	Malone.....	Village sch. dist. lib.	1858	I	i
396	".....	Wadhams reading circle.	1894	G	a
397	Manlius.....	St John's mil. sch. lib.	1869	I	i
398	".....	Union sch. lib.	?	I	i
399	Marathon.....	Peck mem. lib.	1894	G	a
400	Marcellus.....	Union sch. lib.	1892	I	i
401	Margaretville.....	Union sch. lib.	1893	I	i
402	Marion.....	Col. inst. lib.	1854	I	i
403	Maspeth.....	Union sch. lib.	1872	?	?
404	Massena.....	Union sch. lib.	1866	I	i
405	Matteawan.....	Howland circ. lib.	1872	G	?

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
E. Mahony		Sch.	Gen.	Fl.		35	3637 361
.....		Sch.	St. Gen.	Fl.			1262 362
.....		Pub. sch.	Tax. St.	F.			1365 363
J. H. Filer		Pub. sch.	Tax. St.	F.		27	387 364
Ione Bowman		Mem.	St. Gen.	F.	70	5	523 365
C. L. Bailey		Pub. sch.	Tax.	Fl.		5	402 366
Thomas Watson		Pub. D.	Tax. St.	F.	61		1135 367
B. B. Farnsworth		Pub. sch.	Tax. St.	Fl.		105	586 368
C. T. R. Smith		Sch.	Gen.	F.			562 369
W. J. Shelliday		Pub. sch.	Tax.	F.	7		1894 370
F. DeL. King		Pub. sch.	Tax. St.	F.	1	175	† 600 371
Catherine Cameron		Mem.	Fees	F.	a 24	a 16	a 2000 372
M. B. Hopkins		Pub. sch.	Tax. St.	Fl.		140	1281 373
E. E. Hinman		Mem.	Gen.	Fl.			522 374
Nettie A. Ward		Pub. D.	Tax. St.	F.		79	1106 375
.....		Sch.	St. Gen.	R. Fl.	750	40	5290 376
L. S. Minckley		Pub. sch.	Tax. St.	F.		233	351 377
Helen L. Page		Pub. sch.	Tax. St.	F.			340 378
T. A. Caswell		Pub. sch.	Tax. St.	F.		1000	4000 379
G. E. Waller		Pub. sch.	Tax. St.	Fl.	4	159	612 380
C. T. F. Lyon		Pub. D.	Tax.	F.			719 381
C. S. Williams		Pub. sch.	Tax. St.	Fl.			† 750 382
E. H. Belknap		Pub. D.	Tax. St.	F.	2	331	5663 383
Sister Marie Joseph		Sch.	Gen.	Fl.		20	† 1120 384
.....		Pub. sch.	Tax. St.	Fl.			741 385
Miriam S. Draper		Pub.	Tax. St.	F.	† 5000	7	† 5000 386
.....		Pub. sch.	Tax. St.	F.		172	684 387
Mary N. Cox		Sch.	St. G.	F.	25		3959 388
Cynthia U. Weld		Pub. sch.	Tax. St.	F.	3		682 389
F. H. Gardner		Pub. sch.	Tax. St.	F.	† 80	† 187	† 2453 390
Leo H. Bailey		Pub. sch.	Tax. St.	R.		62	395 391
G. H. Cullings		Pub. sch.	Tax. St.	F.		83	294 392
Frank O. Green		Pub. D.	Tax. St.	F.	135	110	671 393
.....		Pub. sch.	Tax. St.	Fl.			414 394
.....		Pub. sch.	Tax. St.	F.	180		5115 395
Frank J. Kelly		Mem.	St. Fees.	F.		463	500 396
.....		Sch.	Gen.	Fl.			700 397
A. E. Neeley		Pub. sch.	Tax. St.	Fl.	6	109	1050 398
C. A. Brooks		End.	End. St.	F.		†	1000 399
B. N. Strong		Pub. sch.	Tax. St.	Fl.		25	609 400
Anna Winter		Pub. sch.	Tax. St.	F.	2	13	728 401
.....		Sch.	Gen.	Fl.			350 402
A. C. Mitchell		Pub. sch.	Tax. St.	F.		55	1055 403
W. C. Davis		Pub. sch.	Tax. St.	R. Fl.			412 404
Mrs J. N. Badeau		Mem.	End. Fees.	S.		b 158	b 6065 405

a For year ending Oct. 1, 1896.

b For year ending Nov. 1, 1895.

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
361			120		?			
362								
363								
364	242	100	90	2	25		\$10	\$10
365	763	↑ 85	175	3	3			45
366		?	37				25	
367	3333	157	193	4½	4½		56 48	
368	726	↑ 2000	200	27½			49 03	49 02
369	?	?	↑ 200	3	30			
370	1122		48	6				
371	1800	↑ 60	64	1			50	71 50
372	2000		104	11		\$82		
373	400	?	40	1	30		50	19 24
374	612		50	2				
375	1610	?	↑ 92	3			100	25
376	340		228	8	8			
377	400		40	1				114 26
378	213		39	½			25	17 50
379	5100	50	130	7½			300	500
380	965	?	↑ 200	5	30		25	97
381	2641		51	4	4		25	
382	↑ 1000	?	125	1	30		15	10
383	15,728	↑ 6000	300	36	36		600	200
384	↑ 200		↑ 100	?				
385								
386							3000	200
387	275		200	5			29 25	61 36
388	750		200	5	5			
389	144	?	200	5				
390	1757		↑ 45	1			88 78	88 78
391		?	174		40		25	25
392	↑ 900		52	1				40 60
393	1768	1850	240	40	40		50	52 54
394	650		39	2			54 79	29 79
395	↑ 15125	↑ 2015	305	30	30		1000	100
396	800	200	175	6	6			200
397								
398	600		40	1			9	50
399	2484	?	131	32½	32½	807 07	150	150
400	↑ 900	?	185	8	8			
401	1426	1680	200	2	30		25	25
402								
403		250	200	5	25		25	25
404	?	?	195		25			
405	6054	?	309	69	69	372 91		

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	.....	.....	.....	.....	.....	.....	361
.....	.....	.....	.....	.....	.....	.....	362
.....	.....	.....	.....	.....	.....	.....	363
.....	.....	\$20	\$20	.....	.....	\$20	364
.....	\$66 24	111 24	44 53	.....	\$35 46	79 99	365
.....	.....	25	39	.....	.....	39	366
\$50 32	.....	106 80	.....	\$102 95	3 85	106 80	367
.....	.....	98 05	98 05	.....	.....	98 05	368
.....	.....	.....	.....	.....	.....	.....	369
.....	.....	.....	.....	.....	.....	.....	370
.....	7 20	128 70	128 70	.....	.....	128 70	371
60	97 72	239 72	12 35	5	82 35	99 70	372
.....	.....	69 24	64 15	.....	.....	61 15	373
.....	11 10	11 10	.....	.....	.....	.....	374
.....	41 43	166 43	73 02	63	14 06	150 08	375
.....	95	95	109	60	.....	169	376
.....	200	314 26	.....	.....	.....	.....	377
.....	.....	42 60	5 40	.....	.....	5 40	378
.....	540	1340	1,040	1200	1100	1,340	379
.....	72	194	140 21	.....	.....	140 21	380
.....	.....	25	.....	25	.....	25	381
.....	2	27	25	.....	.....	25	382
.....	31 78	831 78	400 88	300	20 68	721 06	383
5	.....	5	27	.....	.....	27	384
.....	.....	.....	.....	.....	.....	.....	385
.....	60	3,260	.....	.....	.....	.....	386
.....	.....	90 61	46 25	.....	.....	46 25	387
.....	.....	.....	.....	.....	.....	.....	388
.....	.....	177 56	184 71	25	.....	209 71	389
.....	.....	50	50	.....	.....	50	391
.....	40 60	81 20	85	.....	.....	85	392
.....	12 54	115 08	106 08	.....	9	115 08	393
.....	.....	84 58	84 58	.....	.....	84 58	394
.....	22 01	1,122 01	427 26	250	68 97	746 23	395
142 60	215 92	558 52	383 01	105 95	.....	488 96	396
.....	.....	.....	.....	.....	.....	.....	397
.....	41	100	100 22	.....	.....	100 22	398
.....	1,015 80	2,122 87	347 78	200	576 88	1,124 66	399
.....	16 12	16 12	16 12	.....	.....	16 12	400
.....	5	55	47	8	.....	55	401
.....	.....	50	.....	.....	.....	.....	402
.....	.....	.....	.....	.....	.....	.....	403
.....	.....	.....	.....	.....	.....	.....	404
205	301 92	879 83	263 30	175	441 53	879 83	405

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
406	Matteawan.....	Union sch. lib.....		I	i
407	Mayville.....	Union sch. lib.....	1867	I	i
408	Mechanicville.....	Union sch. lib.....	1893	I	i
409	".....	Y. M. C. A. R. R. branch lib.....	1887		
410	Medina.....	High sch. lib.....		I	i
411	Mellenville.....	Mellenville pub. lib.....	1893	R	c
412	Mexico.....	Union sch. lib.....	1826	I	i
413	Middle Granville.....	Union sch. lib.....		I	i
414	Middleport.....	Union sch. lib.....	1892	I	i
415	Middletown.....	Middletown pub. sch. lib.....	1879	I	i
416	".....	St Hosp. Leonora S. Bolles mem. lib.....	1891		
417	".....	Wallkill free acad. lib.....	1887	I	i
418	Milford.....	Union sch. lib.....	1895	I	i
419	Mineville.....	Union sch. lib.....	1883	I	i
420	Mohawk.....	Mohawk pub. lib.....	1893	R	c
421	".....	Union sch. lib.....		I	i
422	Montgomery.....	Union sch. lib.....	1787	I	i
423	Monticello.....	Union sch. lib.....	1893	I	i
424	Montour Falls.....	Cook acad. lib.....	1872	I	i
425	".....	Havana free lib.....	1874	R	c
426	Moravia.....	Powers lib. ass'n.....	1880	G	
427	".....	Union sch. lib.....		I	i
428	Moriah.....	Sherman coll. inst. lib.....	1873	I	i
429	Morris.....	Union sch. lib.....		I	i
430	Morristown.....	Morristown pub. lib.....	1894	R	c
431	Morrisville.....	Union sch. lib.....	1891	I	i
432	Mt Morris.....	Union sch. lib.....	1866	I	i
433	Mt Vernon.....	Mt Vernon pub. lib.....	1896	R	c
434	Nanuet.....	Nanuet pub. lib.....	1894	R	c
435	Naples.....	Union sch. lib.....	1862	I	i
436	Nassau.....	Nassau free lib.....	1893	R	c
437	New Berlin.....	Union sch. lib.....	1844	I	i
438	New Hartford.....	Union sch. lib.....		I	i
439	New Paltz.....	St norm al and training sch. lib.....	1885		
440	New Rochelle.....	New Rochelle pub. lib.....	1893	R	c
441	".....	New Rochelle pub. sch. dist. lib.....		I	i
442	New York.....	Acad. of Mt St Vincent lib.....	1846	I	i
443	".....	Aguilar free lib.....	1888	G	
	" 1973 Broadway.....	".....		"	"
	" 113 E. 59th st.....	".....		"	"
	" 176 E. 110th st.....	".....		"	"
	" 616 5th st.....	".....		"	"
444	" Bible House.....	Amer. bible soc. lib.....	1816	I	
445	" University bldg.....	Amer. chem. soc. lib.....	1876	I	

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
Thomas Lockhart		Pub. sch.	Tax. St.	Fl			480 406
L. B. Blakeman		Pub. sch.	Tax. St.	F		90	1027 407
Mirza Brass		Inst.	Gen	F		600	900 408
Mary E. Phelps		Pub. sch.	Tax. St.	F	38	172	1386 409
Mary I. Miller		Pub. D.	St. G.	F		83	421 411
A. W. Skinner		Pub. sch.	St. G.	F		1100	1600 412
W. E. Freeman		Pub. sch.	St. G.	Fl	12	71	465 413
P. R. Stevens		Pub. sch.	St. G.	F	1	54	1800 414
Mary K. Van Keuren		Pub. sch.	Tax. St.	F	12	156	7059 415
W. B. Ewar		Inst.	St	Fl		30	2144 416
		Pub. sch.	Tax. St.	Fl			494 417
		Pub. sch.	Tax. St. G.	F	37	24	318 418
Christopher Keller		Pub. sch.	Tax. St.	R. Fl.		10	578 419
Helen L. Smith		Pub. D.	Tax. St.	F		95	911 420
		Pub. sch.	Tax. St.	Fl			1267 421
Reuben Fraser		Pub. sch.	St. G.	F	12		800 422
W. W. Miller		Pub. sch.	Tax. St.	Fl		109	612 423
Grace Cook		Sch	End. Gen.	R. Fl.	14	3	2174 424
Mrs E. P. Hopkins		Mem	Tax. St.	F	33	144	806 425
Mrs Isaac Butler		Mem	Fees	R. S.	9		3627 426
		Pub. sch.	Tax. St.	Fl		73	828 427
B. L. Brown		End.	Enl. St.	F		150	400 428
		Pub. sch.	Tax. St.	F		25	1000 429
Edwyn Evans		Pub.	St. G.	F	2	104	315 430
		Pub. sch.	Tax. St.	F		30	1410 431
Ida Kelsall		Pub. sch.	Tax. St.	F		13	1013 432
Helen K. Gay		Pub. D.	Tax. St.	F	469		5594 433
Emory Rikert		Pub. D.	Tax. St.	F		105	934 434
W. C. Noll		Pub. sch.	Tax. St.	F	15	98	1548 435
E. T. Oleott		Mem	St. G.	F		135	613 436
W. A. Ingalls		Pub. sch.	Tax. St.	Fl		115	1850 437
F. B. Spaulding		Pub. sch.	Tax. St.	Fl	10	1	594 438
K. A. Gage		Sch	St	Fl		123	2896 439
M. E. Huntington		Pub. D.	Tax. St.	F	63	508	3285 440
Alice M. Beaudry		Pub. sch.	Tax. St.	Fl		95	305 441
Sr. A. Dolores		Sch	Gen	Fl		130	16150 442
Pauline Leipziger		Mem	E. St. Sdy	F		6978	35,466 443
"		"	"	"		2534	17633
"		"	"	"		1158	12164
"		"	"	"		3014	3014
"		"	"	"		272	2655
E. W. Gilman	Theo	Inst.	G. Gen.	Pri		156	15297 444
F. E. Dodge	Sci.	Mem	Gen	Fl		50	12100 445

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
406								
407	1500	11590	189	2	30			
408	4800	1500	46	2				\$91
409	350		312	72	72			
410	1870	176	140	4			\$150	100
411	408		218	30				36
412	400		200	1	30			80
413	640		38	1				30
414	11200		80	2				50
415	25,468	1	290	21	21		1400	
416			101	6				
417								
418	430	321	100	2	5		4 95	4 50
419	1143	1	85	2			40 13	40 12
420	2632		156	3			132 15	68 01
421								
422	430		200	35	35			
423	500		196	2½			28 61	25
424	615	1327	229	22	22	\$80 76		
425	4456		156	4½			100	50
426	329	1	102	7	7			
427	352		80	2			25	56 40
428	2350	50	300	30				67 71
429	1000		35	1	20			25
430	2166		150	3				40
431	136	1	190	1	10			
432	690		52	2			75	41 99
433	3378	150	43	48	48		2650	
434	1150	150	190	12	12		50	50
435	356	1600	180	1	20			43 85
436	2500		156	4				75
437	296	1	185	2	25		50 72	60
438	444		184	2½	1			
439								
440	16,511		298	22			3500	
441			189				200	
442	11500	11365	1245	112	50			
443	296,809							
	156,965							
	101,390							
	12,600							
	25,854							
444								
445								

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
							406
			\$132			\$132	407
	\$91	\$182	182			182	408
							409
		250	200	\$50		250	410
							411
	36	72					412
	80	160	121 85			121 85	413
	60	90	90			90	414
	50	100	118 20			118 20	415
	93 62	1,493 62	239 73	532	\$196 05	967 78	416
							417
	48	57 45	4 95			4 95	418
			80 25			80 25	419
	3 36	203 52	143 52	57	3	203 52	420
							421
							422
		53 61	103 61			103 61	423
	226 19	306 95	106 95	200		306 95	424
	36 29	186 29	133 90		83 29	217 19	425
							426
\$17 25	16	33 25		26	6	32	427
	31 40	112 80					428
	67 71	135 42	135 42			135 42	429
	37 75	62 75					430
	58 15	98 15	80 46		2 15	82 61	431
			45 19			45 19	432
	36 91	153 90	25 95	50	100	175 95	433
		2,650	6 70	212 49	655 69	874 88	434
	2 62	102 62	100 75		2 27	103 02	435
		43 85	87 70		3	90 70	436
							437
6 50	204 89	286 39	116 78	15	130 78	262 56	438
	10	120 72	120 72			120 72	439
	50	50	50			50	440
							441
	82 77	3,582 77	635 81	702	700 46	2,038 27	442
							443
106		200	182 07			182 07	444
		1106	155		110	165	445
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LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
G: C. Hurlbut		Mem	G. Gen	R. S.	502	15804	446
G: Whitfield jr.		Mem	Gen	R.Fl.	35	13857	447
Anthony Woodward		Inst	Gen	R	1833	31064	448
	Sci.	Mem	Gen	R	e 213	e 1	e 5105
	Med.	Coll.	Gen	Fl		400	450
W: J. C. Berry	Law	Mem	Gen	Sl	2471	1355	50,154
N. W. Liggett		Coll.	Gen	Fl		700	452
W. H. Grant		Inst	G. Gen	R.Fl.	653	81	7000
H. E. Waste		Par	Gen	F		42	2258
Lilian Denio	Ped.	Coll.	St. G	R.Fl.	337	621	7569
Agnes Wallace		Par	G	F	1552	886	d 20,032
C. J. Herbermann		Coll.	End. Tax.	Fl	145	784	30,271
Helen Ingersoll	Phar	Coll.	Gen	R		26	4649
Ja. P. Fagan		Coll.	Gen	Fl	120	1500	7800
		Coll.	Gen	Fl	1250	11800	28,000
J. H. Huddleston		Coll.	Gen	Fl			500
Mary W. Booth	Med.	Inst	Gen	Fl		3	11200
		Inst	Gen	Fl		24	749
G: H. Baker		Coll.	E. G. Gen.	R. Fl.	4767	15,813	223,000
L. C. L. Jordan		Inst	Gen	R	547	866	33,794
M. R. Birnie		Inst	Gen	F	54		2159
	Med.	Coll.	Gen	Fl			2156
Thomas Campbell	Law	Inst	Gen	Fl	102	428	14,896
S. M. Fairfield		Inst	Gen	R			2100
R. N. Greene		Mem	Fees.	Sl	290		3750
Jacob Schwartz		Mem	End. Sdy.	F	e 460	e 4677	e 106,440
	Theo	Coll.	End G	R. Fl.			26,367
Hermann G. Klotz	Med.	Inst	Gen	Fl	23	132	5617
G: M. Perry		Mem	End. Fees	R. S.	293	631	19,367
R. S. Tracy	M. S.	Gov	Gen	R	33	17	1551
Edgar S. Barney		Sch	G	Fl	75	25	1700
C: S. Baker		Inst	G	Fl			600
Bro. Amos Michael		Sch	(Gen)	Fl	400		1200
P. J. Moog		Mem	Fees.	Fl	e 45	e 103	e 1277
Josephine Bacharach		Mem	Gen	F	e 904	e 457	e 44,893
P. J. Castles		Coll.	Gen	Fl	180	1250	8485
A. E. Macdonald		Inst	St.	Fl		200	6141
P. W. Houghton	Stat.	Inst	Gen	Fl	1100	32	11500
E. Lewenstein		Inst	Gen	Fl			10,000
Isabel C. Thornton	Sci.	Mem	St. Fees.	R		185	3200

c For year ending Dec. 31, 1895.

d Does not include vols. in branches.

e For year ending Nov. 30, 1895.

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
446	-----	?	274	-----	48	\$8424 73	-----	-----
447	10	?2000	306	51	51	-----	-----	-----
448	-----	10,375	300	-----	48	-----	-----	-----
449	-----	-----	306	-----	44	-----	-----	-----
450	-----	-----	-----	-----	-----	-----	-----	-----
451	-----	-----	365	-----	112	-----	-----	-----
452	-----	-----	200	?	?	-----	-----	-----
453	-----	-----	315	48	48	-----	-----	-----
454	891	56	118	15	66	-----	-----	-----
455	11,322	?	?250	44	44	-----	-----	\$200
456	a 69,130	7113	290	74	74	-----	-----	-----
	2725	-----	111	6	6	-----	-----	-----
	3495	-----	160	8	8	-----	-----	-----
	4335	-----	94	5	5	-----	-----	-----
	2479	-----	80	4	4	-----	-----	-----
	2223	-----	40	4	4	-----	-----	-----
457	4041	?	273	41	41	1308	\$1792 23	-----
458	?125	?500	300	39	39	-----	-----	-----
459	-----	?	145	5	3	-----	-----	-----
460	?2900	-----	-----	-----	-----	-----	-----	-----
461	-----	?	180	-----	48	-----	-----	-----
462	-----	-----	-----	-----	-----	-----	-----	-----
463	-----	-----	-----	-----	-----	-----	-----	-----
464	59,756	-----	307	87	87	9365	-----	-----
465	-----	283,632	327	-----	93	-----	-----	-----
466	8757	?	281	30	30	?	?	-----
467	-----	-----	-----	-----	-----	-----	-----	-----
468	-----	-----	306	-----	60	-----	-----	-----
469	-----	25	35	-----	6	-----	-----	-----
470	-----	?	220	-----	36	991 69	-----	-----
471	247,906	4205	304	78	78	-----	-----	-----
472	-----	-----	-----	-----	-----	-----	-----	-----
473	71	-----	?305	18	18	-----	-----	-----
474	38,337	?	304	72	72	61 30	-----	-----
475	?	?	305	38	38	-----	-----	-----
476	-----	-----	?40	2	-----	-----	-----	-----
477	-----	-----	365	-----	-----	-----	-----	-----
478	?600	?900	192	30	-----	-----	-----	-----
479	581	-----	24	?	-----	-----	-----	-----
480	94,828	35,537	360	66	66	-----	-----	-----
481	-----	460	?263	7	4	-----	-----	-----
482	27,738	-----	106	-----	-----	-----	-----	226 83
483	-----	?1000	306	-----	-----	-----	-----	-----
484	-----	-----	-----	-----	?90	1000	-----	-----
485	-----	1500	300	-----	72	-----	-----	100

a Does not include vols. in branches.

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
\$7,640	\$25,000	\$41,064 73	\$1,353 26	\$5,064	\$4,294 96	\$10,712 22	446
			160 10	600	900	1,660 10	447
			67 75	1,363		1,430 75	448
							449
							450
							451
							452
			60	405		465	453
	2,200	2,400	1,411 85	1,111 67		2,523 52	454
	3,728 05	3,728 05	1,886 96		4,027 11	5,914 07	455
							456
							457
		3,100 23	2,354 61	1,506 33		3,860 94	458
	825	825	356 12	624		980 12	459
			675	314	?	989	460
					100	100	461
	10	10	10			10	462
	23 55	23 55	23 55			23 55	463
	46,876	50,841	33,158 48	23,000	1,625	57,783 48	464
			1,903 32	5,029 50	295 63	7,228 75	465
			77 10	540		617 10	466
			1,874 24			1,874 24	467
							468
1,455	1,175 80	3,622 49	1,248 35	99	1,257 24	2,604 59	469
			6,602 26	8,317 22		14,919 48	470
							471
695		695	594 49		25 54	620 03	472
1,215 99	2,840 60	4,117 89	1,106 86	2,434 95	1,734 38	5,276 19	473
			132 15			132 15	474
							475
	775	775					476
			90			90	477
264 89		264 89	171 65		93 24	264 89	478
	2,161 05	3,161 05	995 41	762	310 90	2,068 31	479
			317 60			317 60	480
		226 83	226 83			226 83	481
			302 47			302 47	482
		1,000					483
800	450	1,350	550	1,000	5,576	7,126	484
							485

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
486	New York, 213 W. 54th st	Med. coll. and hosp. for women lib.	.....	I	i
487	" Clinton Hall.....	Mercantile lib.....	1820	L	...
488	" Cen. pk. op. E. 82d	Metropolitan museum of art lib.....	1880	I	...
489	" 64 Madison av.....	Mott mem. med. and surg. lib.....	1867	...	...
490	" 109-11 W. 77th st..	Mrs L. Weil's sch. for y'ng ladies lib..	1867	...	...
491	" 156 Broadway.....	Nat. board of fire underwriters lib..	1870	...	...
492	"	New York free cir. lib.....	1880	L	...
	" 49 Bond st.....	Bond st. lib.....	.....	...	...
	" 135 Second av.....	Ottendorfer lib.....	.....	...	...
	" 226 W. 42d st.....	George Bruce lib.....	.....	...	...
	" 251 W. 13th st.....	Jackson sq. lib.....	.....	...	...
	" 18 E. 125th st.....	Harlem lib.....	.....	...	...
	" 49 W. 20th st.....	Muhlenberg lib.....	.....	...	...
	" 816 Amsterdam av..	Bloomingdale lib.....	.....	...	...
493	" 8 W. 16th st.....	New York hosp. lib.....	1796	...	...
494	" 412 9th av.....	N. Y. inst. for the blind.....	1831	...	...
495	" 116 Post-office bldg	New York law inst. lib.....	1828	I	...
496	" 120 Broadway.....	New York law sch. lib.....	1891	I	i
497	" 34 Lafayette pl....	N.Y. p. l. Astor, Lenox & Tilden f'd's.	1895	L	...
498	" 109 University pl..	N. Y. society lib.....	1754	aK	...
499	" 1st av. 67 & 68th st	N. Y. trade sch. lib.....	1895	I	i
500	" 66-68 E. 4th st....	N. Y. Turn Verein.....	1850	I	...
501	" Washington sq. E..	N. Y. university lib.....	1831	I	i
502	"	Normal coll. lib.....	1886	I	i
503	" 59-63 2d st.....	Olivet lib.....	.....	I	...
504	" 303 E. 20th st.....	Post grad. med. sch. & hosp. lib.....	1882	I	i
505	" 259 W. 69th st.....	Riverside free lib.....	1894	I	r
506	" 121 W. 91st st.....	St Agnes free lib.....	1893	R	c
507	" 38 Bleecker st.....	St Barnabas free reading room.....	1867	I	...
508	" 609 Fifth st.....	St Francis hosp. lib.....	1865	I	...
509	" 311 E. 36th st.....	St Gabriel's sch. lib.....	.....	I	i
510	" 207 E. 16th st.....	St George's free circ. lib.....	1893	I	...
511	" Fordham	St John's coll. lib.....	1846	I	i
512	" 700 Park av.....	Union theo. sem. lib.....	1836	I	i
513	" 32 E. 26th st.....	University club lib.....	1879	I	...
514	" 26 Delancey st.....	University settlement free lib.....	1892	I	...
515	" Bedford Park.....	Ursuline convent lib.....	1855	I	i
516	" 280 W. 71st st....	Van Norman inst. lib.....	1857	...	...
517	" Amst'm a. W. 156th	Washington hights free lib.....	1868	G	r
518	" Foot of E. 76th st.	Webster free lib.....	1894	I	r
519	" 19 Clinton pl.....	Woman's lib.....	1865	I	...
520	" 321 E. 15th st.....	Women's med. coll. of N.Y. infirm lib.	1884	I	i
521	" 52 E. 23d st.....	Y. M. C. A. lib.....	1852	I	...
522	" 5 W. 125th st.....	Y. M. C. A. Harlem branch lib.....	1868	I	...
523	" 361 Madison av.....	Y. M. C. A. R. R. branch lib.....	1887	...	...
524	" 7 E. 15th st.....	Y. W. C. A. lib.....	1870	I	r
525	Newark	Union sch. lib.....	.....	I	i

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
.....	Coll.	Gen.	Fl.	.....	.....	908 486
W. T. Peoples	Mem.	Fees	S.	518	5830	253,783 487
W. L. Andrews	Art.	Inst.	End. Gen.	Fl.	92	236	4681 488
J. W. S. Gonley	Med.	Mem.	End.	R.	.....	.....	3000 489
Mrs Leopold Weil	Pri.	Gen.	Fl.	.....	?	2000 490
H. K. Miller	Stat.	Mem.	Gen.	Fl.	.....	.....	500 491
A. E. Bostwick	Mem. Ed.	E. T. G.	F.	2091	9110	690,446 492
.....	80	761	19,956
.....	143	2403	24,526
.....	246	1261	19,300
.....	68	890	13,412
.....	382	2029	6651
.....	253	933	4793
.....	919	1889	2808
F. P. Foster	Med.	Inst.	Gen.	F.	.....	.....	726,000 493
F. B. Wait	Inst.	Gen.	Fl.	.....	39	3000 494
W. H. Winters	Law.	Inst.	Fees	S.	168	1569	45,038 495
.....	Law.	Sch.	Gen.	Fl.	.....	114	1733 496
Robbins Little	End.	End.	R.	3951	11,643	367,808 497
F. B. Bigelow	Mem.	End Fees	R. S.	o 487	c 3469	1010000 498
.....	Sch.	Gen.	Fl.	.....	.....	600 499
H. Wewerka	Mem.	Gen.	Fl.	?	75	3500 500
L. J. Tompkins	Coll.	Gen.	R.	5412	1357	32,958 501
Edith Rice	Mem.	G.	Fl.	179	10	4589 502
Lizzie F. Baker	Par.	G.	F.	73	157	2626 503
.....	Med.	Coll.	Gen.	Fl.	25	.....	1600 504
Kate Kaufman	Med.	Inst.	St Gen.	F.	283	583	1930 505
Anne L. Gibson	Mem.	St Gen.	F.	537	431	2800 506
H. Meyer	Inst.	G.	R.	47	.....	990 507
Sister Josephine	Inst.	G.	Fl.	.....	.....	1030 508
.....	Sch.	Gen.	Fl.	.....	.....	306 509
Emma A. Bays	Par.	Gen.	Fl.	110	.....	4110 510
Joe Zwinge	Coll.	Gen.	Fl.	60	406	35,116 511
C. R. Gillett	Coll.	End.	R. Fl.	.....	.....	70,000 512
Lyman H. Bagg	Mem.	Gen.	Fl.	d 166	d 808	d 12,866 513
Helen Moore	Inst.	Gen.	R. S.	1300	125	2649 514
Mother M. Fidelis	Sch.	Gen.	Fl.	.....	?	1600 515
Mme Van Norman	Sch.	G. Gen.	Fl.	?	?	1000 516
A. R. Van Hoevenb'g	Mem.	G. Fees	F.	106	352	9844 517
W. S. Booth	Inst.	Tax. St.	F.	383	457	6025 518
M. J. Kemp	Inst.	Gen.	Fl.	.....	.....	1500 519
Mary H. Stockwell	Med.	Coll.	End. Gen.	Fl.	33	16	825 520
Werner Jonghaus	Inst.	End. G.	R.	e 391	e 775	e 43,666 521
F. G. Banister	Inst.	G. Gen.	Fl.	.....	.....	2680 522
W. F. Stevens	Inst.	G.	Fl.	61	402	7500 523
Harriet F. Husted	Inst.	St. Gen.	R. Fl.	.....	e 1510	e 24,407 524
.....	Pub. sch.	St.	R. Fl.	.....	1150	525

Including branches.

c For year ending Mar. 31, 1896.

d For year ending Feb. 29, 1896.

e For year ending Dec. 31, 1895.

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
486								
487	146,680	40,460	306	63	75	\$1010		
488			282		42	292		
489			300		84			
490								
491								
492	686,504	22,316	361	77	77			
	102,034	4048		77	77			
	156,529	6604		77	77			
	180,407	3566		77	77			
	94,132	6085		77	77			
	105,871	1784		77	77			
	43,553	249		74				
	3978	10		72				
493			298	42	42			
494			246	2	84			
495			304	78				
496		?	255		54			
497		279,677	309		54	172,042 58		
498	27,174	\$5000	307	54	66	5196 35		
499	890		149	11				
500	\$1500	\$50	\$100	4	4			
501		?	303		48			
502	3757	\$2000	191	37	37			
503	5935	32	240	25	78			
504		?	365		81			
505	15,738		272	31	31	30		\$200
506	32,782	?	304	26	26			200
507		\$3500	240		18			
508		?	313	6				
509								
510			208	7				
511	8200	6200	200	5	6			
512			220	70	70			
513			365		133			
514	28,257	?	292	38	58			
515		1000	69					
516								
517	30,870	1040	305	63	63			
518	26,561	\$200	313	36	36		\$1750	200
519			313	42	42			
520	\$1223	?	200	39	54	250		
521		\$52,414	365		89	4500		
522	2505		313	78	78			
523	12,337	1300	365	70	17			
524	64,529	\$4480	297	73 1/2	73 1/2			200
525			40	3	3			

LIBRARIES (continued)

FROM		Total receipts	PAYMENT FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
\$16,190	\$10,936 38	\$28,136 38	\$8959 45	\$7781 98	\$9983 59	\$26,725 02	486
	1520	1812	1151 10		84 69	1235 79	487
	1200	1200			1000	1000	488
							489
							490
							491
							492
			1868 03			1868 03	493
			140 97			140 97	494
							495
	256 90	256 90	256 90			256 90	496
	641 12	172,683 70	46,470	48,960 52	17,802 24	113,233 76	497
3143	1386 10	9725 45	3817 97	5216 82	1337 75	10,372 54	498
							499
	100	100	90			90	500
	2464 37	2464 37	2464 67	2097 83		4562 50	501
							502
							503
	1166 84	1396 84	489 63	821 25	85 65	1396 53	504
							505
	1036 95	1236 95	783 36	627	165 81	1576 17	506
	103 61	103 61	103 61			103 61	507
							508
							509
45	350	395	29	300	20	349	510
190		190	582		100	682	511
	5124	5124	2889	1860	375	5124	512
99 90	1090 09	1189 99	286 40	760	143 59	1189 99	513
							514
							515
590	1528 76	2118 76	608 28	921 70	774 39	2304 37	516
	200	2150	525	1134	491	2150	517
							518
37 50		287 50	199 60	130		329 60	519
							520
1	3596 67	8096 67	3729 57	3684	521 02	7934 59	521
300	175	475	175	300		475	522
			212 55		44 94	357 49	523
	1626 72	1826 72	1497 36	2438 10	245 11	4180 57	524
							525

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
526	Newark Valley	Union sch. lib.	1889	I	i
527	Newburgh	Mt St Mary's acad. lib.	1887	I	i
528	"	Newburgh free acad. lib. ....	.....	I	i
529	"	Newburgh free lib.	1852	L	...
530	"	2d jud. dist. law lib.	1885	L	...
531	Newfield	Newfield pub. lib.	1889	R	c
532	Newtown	Union sch. lib. ....	.....	I	i
533	Niagara Falls	High sch. lib. ....	.....	I	i
534	"	Niagara Falls pub. lib.	1895	R	c
535	Niagara University	Niagara univ. art. dep't lib.	1864	I	i
536	"	Sem. of our Lady of Angels lib.	1864	I	i
537	Nichols	Union sch. lib.	1873	I	i
538	North Brookfield	Union sch. lib.	1881	I	i
539	North Cohocton	Union sch. lib.	1892	I	i
540	North Olean	Union sch. lib.	1884	I	i
541	North Tarrytown	Union sch. lib.	1876	I	i
542	North Tonawanda	High sch. lib.	1893	I	i
543	"	North Tonawanda pub. lib.	1893	R	c
544	Northville	Northville lib.	1893	I	i
545	Norwich	Union sch. lib.	1873	I	i
546	Norwood	Union sch. lib.	1886	I	i
547	Nunda	Union sch. lib.	1876	I	i
548	Nyack	Nyack lib.	1879	G	a
549	"	Union sch. lib. ....	.....	I	i
550	Oakfield	Cary coll. sem. lib.	1845	I	i
551	"	Union sch. lib.	1892	I	i
552	Oceanus	Rockaway Beach un. sch. lib.	1893	I	i
553	Ogdensburg	Ogdensburg free acad. lib. ....	.....	I	i
554	"	Ogdensburg pub. lib.	1893	R	c
555	"	St Mary's acad. lib.	1891	I	i
556	Olean	Forman lib.	1871	L	r
557	"	High sch. lib. ....	.....	I	i
558	Oneida	Union sch. lib. ....	.....	I	i
559	Oneida Castle	Union sch. lib.	1894	I	i
560	Oneonta	Oneonta pub. lib.	1892	R	c
561	Onondaga Valley	Onondaga free acad. lib.	1813	I	i
562	Ontario	Union sch. lib.	1895	I	i
563	Orchard Park	Union sch. lib.	1878	I	i
564	Oriskany	Union sch. lib. ....	.....	I	i
565	Oriskany Falls	Union sch. lib. ....	.....	I	i
566	Oswego	High sch. lib.	1885	I	i
567	"	Oswego city lib.	1853	L	...
568	"	Oswego city sch. lib. ....	.....	I	...
569	"	State normal and training sch. lib. ....	.....	I	r
570	"	Y. M. C. A. R. R. branch lib.	1887	I	...

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
Bertha B. Benedict		Pub. sch.	Tax. St.	F		52	471 526
Sister M. Emmanuel		Sch	St. Gen.	Fl		150	1950 527
.....		Pub. sch.	Tax. St.	Fl			514 528
C. Estabrook		Pub. sch.	αTax. St.	F	541	920	21,670 529
Howard Thornton		Gov	St	Fl		795	4879 530
Dora M. Ham		Mem	Tax. St.	F	15	42	545 531
M. I. Jewell		Pub. sch.	Tax. St.	Fl			337 532
.....		Pub. sch.	Tax	Fl			583 533
N. L. Benham		Pub. D ..	Tax. St.	F	336	559	3888 534
Luke A. Grace		Coll	Gen	Fl	135	1265	17300 535
Luke A. Grace	Theo	Coll	Gen	Fl	115	125	11000 536
C. Juliet Laning		Pub. sch.	Tax. St.	F	2	2	500 537
G. S. Hardy		Pub. sch.	Tax. St.	Fl	3	27	558 538
Susan Bushnell		Pub. sch.	Tax. St.	F	4	93	457 539
F. W. Mundt		Pub. sch.	Tax. St.	R. Fl		36	420 540
N. H. Dumond		Pub. sch.	Tax. St.	F	7	128	952 541
.....		Pub. sch.	Tax. St.	Fl	1	32	571 542
C. S. Marsh		Pub. D ..	Tax. St.	F	9	406	2270 543
V. J. Smith		Pub. sch.	Tax. St.	F	4	60	591 544
Mina B. Blackman		Pub. sch.	Tax. St.	Fl		245	4091 545
E. F. McDonald		Pub. sch.	Tax. St.	R. Fl	5	100	826 546
W. M. Robinson		Pub. sch.	Tax. St.	Fl	4	73	683 547
Helen L. Powell		Mem	Tax. St.	F	132	410	3914 548
Ira H. Lawton		Pub. sch.	Tax. St.	R. Fl	6		1327 549
Curtis C. Gove		Sch	Gen	R. Fl			880 550
A. M. McIlroy		Pub. sch.	Tax. St.	F		131	607 551
W. M. Gilmore		Pub. sch.	Tax. St.	Fl	16	409	485 552
.....		Pub. sch.	Tax. St.	Fl			1600 553
Fred Van Dusen		Pub. sch.	Tax. St.	F	633	608	6246 554
.....		Sch	Gen	Fl	2	36	703 555
Ella M. Hazlett		Mem	End. Fees	R. S.	8	38	4580 556
Gertrude M. Leete		Pub. sch.	Tax. St.	Fl			2128 557
Mrs J. C. Ayres		Pub. sch.	Tax. St.	F	228	331	2453 558
Caroline B. de Clercq		Pub. sch.	Tax. St.	F	2	1	386 559
Mary E. Phillips		Pub. D ..	Tax. St.	F	2	257	4493 560
D. H. Cook		Pub. sch.	Tax. St.	F		1250	1250 561
M. H. Bigelow		Pub. sch.	Tax. St.	F			3-5 562
A. K. Hoag		Pub. sch.	Tax. St.	Fl		39	75 563
R. W. Huffman		Pub. sch.	Tax. St.	Fl		34	409 564
Josie M. Reed		Pub. sch.	Tax. St.	F		78	375 565
C. W. Richards		Pub. sch.	Tax. St.	R. Fl	6	6	445 566
Robert S. Kelsey		Pub	End	R		175	13,525 567
Robert S. Kelsey		Pub. sch.	Tax. St.	F		25	6174 568
S. Augusta Smith		Sch	St. Gen.	R		604	5510 569
J. G. Watson		Inst	Gen	R. Sl	5	1	609 570

α Tuition fees from resident pupils are appropriated to purchase of books.

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
526			40	1			\$25	\$25
527	180	500	180	2	5			
528								
529	72,934	?	294	72	72		3087 22	196 80
530								600
531	1682		131	3			100	20
532			193	30			75	71 23
533								
534	18,510		226	36			1285	200
535	1,000		1300	1	?			
536	1900		1300	1	?			
537	1100	125	190	42			27	
538	430	1107	76		5		17 45	16 25
539	772		150	6	6		30	55
540	1250		76	24			25	24 87
541	4592		630	3			25	90 61
542		17000	200	40	40		57 88	40
543	8547	1100	1300	30			350 02	200
544	842	1600	40	1			20 28	20 28
545	1376		70	2			257 84	93 57
546	625	800	200	2	30		25	50
547	?	?	200	?	30		25	25
548	21,333	1500	288	52	52		1200	200
549	2525	625	195	5	5			
550		1350	188	25	25			
551	570	50	52	14			100	25
552	710	?	140	24			253 71	141 02
553								
554	14,812	?	312	32	32		1200	200
555	4000	9000	189	35				
556	6820	500	307	42	42	\$421 58		
557	13600	19000	180	4	25		400	23 71
558	7157	850	200	4	20		250	250
559	647		200	1	30		77	17 23
560	19,300	13500	1240	30	30		800	200
561	?	?	200	5	15			
562	525		80	2	10		225	25
563		434	183	6	30		10	8 69
564			189		35		27 82	17 58
565	1900	108	40	3			80	25
566	1200	14000	200	25	25		5	6 45
567		3923	300		39	250		
568	9906		300	39			525 88	184 45
569			260	60	60			
570	797	130	365		594			

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	\$100	\$50 100	\$100	.....	.....	\$100	526
.....	.....	.....	.....	.....	.....	.....	527
.....	.....	.....	.....	.....	.....	.....	528
.....	1952 06	5209 08 600	2632 18	\$2556 600	\$26 90	5209 08 600	529
.....	.....	.....	.....	.....	.....	.....	530
.....	21 94	141 94 146 23	38 79 146 23	25	109 02	172 81 146 23	531
.....	.....	.....	.....	.....	.....	.....	532
.....	31	1516 13	648 80 386	628 80	628 30	1905 90 386	533
\$13	.....	.....	.....	.....	.....	.....	534
.....	.....	.....	.....	.....	.....	.....	535
.....	.....	.....	180	.....	.....	180	536
.....	.....	27	27	.....	.....	27	537
.....	.....	33 70	33 70	.....	.....	33 70	538
.....	.....	85	8	.....	.....	8	539
.....	.....	49 87	40	.....	.....	40	540
.....
.....	.....	115 61	117 32	50	.....	167 32	541
.....	.....	97 88	57 88	.....	.....	57 88	542
.....	.....	550 02	450 02	100	.....	550 02	543
.....	.....	40 56	40 56	.....	.....	40 56	544
.....	.....	351 51	326 41	25	.....	351 41	545
.....
.....	.....	75	77	.....	.....	77	546
.....	4 35	54 35	54 35	.....	.....	54 35	547
.....	.....	1400	530 70	325	532 30	1388	548
.....	.....	.....	45	.....	.....	45	549
.....	.....	.....	.....	.....	.....	.....	550
.....	.....	125	125	.....	.....	125	551
.....	.....	394 73	394 73	.....	.....	394 73	552
.....	.....	.....	.....	.....	.....	.....	553
.....	903 22	2303 22	1020 62	697 61	1791 18	3509 41	554
.....	.....	.....	23 75	.....	.....	25 75	555
.....
165 49	333 70	920 72	250 06	280 50	253 33	783 89	556
.....	.....	423 71	136 10	100	.....	236 10	557
.....	.....	500	540	100	.....	640	558
.....	12 20	30 20	27	.....	.....	27	559
.....	35 24	1035 24	274 28	211 45	372 67	858 50	560
.....
.....	.....	250 00	250	.....	.....	250	561
.....	.....	18 68	18 69	.....	.....	18 69	562
.....	.....	45 40	45 40	.....	.....	45 40	563
.....	.....	105	105	.....	.....	105	564
.....	.....	.....	.....	.....	.....	.....	565
.....	6 45	17 80	10 40	.....	.....	10 40	566
.....	1485 93	1735 93	324 62	493 94	748 26	1566 82	567
.....	.....	710 33	30	452 92	.....	482 92	568
.....	.....	.....	.....	.....	.....	.....	569
100	.....	100	.....	.....	.....	.....	570

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
571	Ovid	Union sch. lib.	?	I	i
572	Owego	Owego free acad. lib.	1848	I	i
573	Oxford	Oxford acad. lib.	?	I	i
574	Oyster Bay	Union sch. lib.	?	I	i
575	Painted Post	Union sch. lib.	1868	I	i
576	Palatine Bridge	Union sch. lib.	1857	I	i
577	Palisades	Palisades lib. and reading room	1891	I	...
578	Palmyra	Class. union sch. lib.	1857	I	i
579	Parish	Union sch. lib.	?	I	i
580	Patchogue	Union sch. lib.	1871	I	i
581	Pawling	Union sch. lib.	?	I	i
582	Peekskill	Drum Hill union sch. lib.	1889	I	i
583	"	Field lib.	1887	L	...
584	"	Peekskill mil. acad. lib.	?	I	i
585	Penn Yan	Penn Yan pub. lib.	1860	R	c
586	Perry	Union sch. lib.	1859	I	i
587	Phelps	Union and class. sch. lib.	1846	I	i
588	Philadelphia	Union sch. lib.	1894	I	i
589	Philmont	Guild Hall lib.	1894	I	...
590	"	Philmont pub. lib.	1893	R	c
591	Phoenix	Union sch. lib.	?	I	i
592	Pike	Pike sem. lib.	1856	I	i
593	Pine Plains	Pine Plains free lib.	1874	R	c
594	"	Seymour Smith acad. lib.	1879	I	i
595	Pittsfield	Union sch. lib.	1893	I	i
596	Plattsburg	D'Youville acad. lib.	1871	I	i
597	"	High sch. lib.	1891	I	i
598	"	Plattsburg pub. lib.	1894	R	...
599	"	St. normal and training sch. lib.	?	I	i
600	Pleasantville	Pleasantville lib. ass'n.	1893	G	a
601	Pocantico Hills	Pocantico Hills lyceum lib.	1891	G	a
602	Pompey	Union sch. lib.	1836	I	i
603	Poplar Ridge	Hazard lib.	1883	G	a
604	Port Byron	Free sch. and acad. lib.	1857	I	i
605	Port Henry	Sherman free lib.	1857	R	c
606	"	Union sch. lib.	?	I	i
607	Port Jervis	Port Jervis free lib.	1892	R	c
608	"	Union sch. lib.	1892	I	i
609	Port Leyden	Union sch. lib.	1893	I	i
610	Port Richmond	Union sch. lib.	?	I	i
611	Port Washington	Port Washington free lib.	1895	R	c
612	Portville	Union sch. lib.	1881	I	i
613	Potsdam	Potsdam pub. lib. and reading room	1887	R	c
614	"	St. normal and training sch. lib.	1899	...	...
615	Poughkeepsie	High sch. lib.	1843	I	i

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
L. H. Clark jr		Pub. sch.	Tax. St.	Fl ..	1	39	759 571
J. B. Worthington		Pub. sch.	Sdy. Fees	F		235	6435 572
W. C. Joslin		Sch.	St. Gen.	Fl ..	4	133	1742 573
Julia L. Thurston		Pub. sch.	Tax. St.	Fl ..		17	717 574
.....		Pub. sch.	Tax. St.	F		20	300 575
A. E. Barnes		Pub. sch.	Tax. St.	F		9	1122 576
E. J. Quidor		Mem	Fees Gen.	F	152		1122 577
.....		Pub. sch.	Tax. St.	F	7	379	2965 578
Josephine C. Meade		Pub. sch.	Tax. St.	F		15	614 579
W. E. Gordon		Pub. sch.	Tax. St.	F	10	84	1300 580
.....		Pub. sch.	Tax. St.	F		91	292 581
John Millar		Pub. sch.	Tax. St.	Fl ..		25	394 582
L. B. Hasbrouck		End	End. G.	F		188	6307 583
.....		Sch.	Gen	Fl ..			1000 584
Henrietta Hicks		Pub. D ..	Tax. St.	F	134	142	1655 585
.....		Pub. sch.	Tax. St.	F		150	1060 586
D. D. Edgerton		Pub. sch.	Tax. St.	F		13	855 587
J. G. Peck		Pub. sch.	Tax. St.	F		92	463 588
C. T. Blanchet		Mem	G	R			1500 589
C. F. Randall		Pub. D ..	Tax. St.	F		130	940 590
May Breed		Pub. D ..	Tax	Fl ..			628 591
R. H. Whitbeck		Sch.	St. Gen.	F		100	500 592
Frank Eno		Pub	Tax. St.	F		76	2104 593
A. Mattice		Sch.	Gen	Fl ..	3		463 594
.....		Pub. sch.	Tax. St.	Fl ..		175	425 595
Sister Edgar		Sch.	Gen	Fl ..		100	1055 596
Emma L. Berry		Pub. sch.	Tax. St.	Fl ..	16	213	1925 597
Ernest S. Hall		Pub	Tax. St.	F	26	458	974 598
Anne J. O'Brien		Sch.	Gen	Fl ..		218	2187 599
Amy C. Romer		Mem	St. G ..	F	46	85	750 600
Mrs R. F. Stewart		Mem	St. Gen.	F	19		1130 601
.....		Pub. sch.	Tax. St.	F	39	81	561 602
Dexter Wheeler		End	End. St.	F		250	1500 603
W. L. Harris		Pub. sch.	Tax. St.	F	25	14	1968 604
C. L. Huntington		End	End. T. St	F	2	2	4945 605
.....		Pub. sch.	Tax	Fl ..			586 606
Mary K. Newman		Pub. D ..	Tax. St.	F	96	1162	7286 607
Tilla M. White		Pub. sch.	Tax. St.	Fl ..		31	407 608
S. J. Neff		Pub. sch.	Tax. St.	Fl ..		20	567 609
S. E. Eldridge		Pub. sch.	Tax. St.	Fl ..	5	148	1080 610
W. M. Mitchell		Mem	St. G ..	F		58	370 611
.....		Pub. sch.	Tax. St.	Fl ..		80	850 612
William Keenan		Pub	Tax	F	1		1287 613
T. B. Stowell		Sch.	St	Fl ..			16500 614
.....		Pub. sch.	Tax	Fl ..			400 615

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
571	?	140	11	---	---	---	\$26 71	\$25
572	17,150	---	90	8	---	---	---	---
573	934	?	188	2	5	---	---	57
574	400	250	200	1	2 1/2	---	20	20
575	220	24	80	5	---	---	10	10
576	1018	---	140	3	---	---	32 90	---
577	1456	---	203	---	11	---	---	---
578	2503	?	190	2	---	---	20	200
579	844	396	168	40	40	---	---	---
580	11500	---	200	2	---	---	131 15	145 88
581	1200	?	191	2 1/2	---	---	50	20 06
582	---	1250	196	---	5	---	25	25
583	122,200	?	296	24	24	\$783 76	---	---
584	---	---	200	---	50	---	---	---
585	4622	?	92	6	6	---	200	125
586	600	---	39	1	---	---	50	50
587	205	150	200	30	---	---	27 60	---
588	11040	---	40	1	---	---	47 63	30
589	---	1100	313	---	18	---	---	---
590	3876	?	1210	3	30	---	50	57 27
591	802	---	67	2	---	---	---	---
592	1700	1200	190	30	30	---	---	47 01
593	22000	---	313	84	84	---	164 50	---
594	?	?	100	10	25	---	---	---
595	610	800	200	2	---	---	68 68	21 90
596	---	1065	242	---	28	---	---	---
597	432	?	186	1 1/2	30	---	106	50
598	9763	---	156	8	8	---	400	200
599	---	---	---	---	---	---	---	---
600	2000	?	308	36	36	36 87	---	140
601	1117	1205	152	6	6	---	---	---
602	---	---	189	10	---	---	25 17	25
603	1280	300	313	48	48	150	---	200
604	1100	?	190	25	---	---	2	5
605	7959	21	306	24	24	600	306	200
606	---	---	---	---	---	---	---	---
607	21,991	?	306	36	36	---	1714 34	700
608	---	407	198	25	25	---	193 19	25
609	---	11290	40	1	---	---	---	---
610	11050	---	138	2	---	---	50	25
611	855	---	95	9	9	---	---	100
612	300	100	180	2	45	---	55 63	18 98
613	543	234	365	13	13	---	1200	---
614	---	---	180	---	45	---	---	---
615	---	---	---	---	---	---	---	---

a Not included in total.

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
\$40 50	\$9 80	\$51 71	\$51 71			\$51 71	571
	86	50 30	300 01	\$103	\$66 40	559 41	572
		143	143			143	573
		40					574
		20	25			25	575
		32 90	32 90			32 90	576
40	500	540	11 40	200	318 84	530 24	577
	200	420	400 10	20		420 10	578
							579
	75	352 03	168 62			168 62	580
	9 93	79 99	79 99			79 99	581
		50	50			50	582
	38 33	822 09	233 44	294 50	206 81	734 75	583
							584
	28 25	353 25	139 46	25	56 92	221 38	585
		100	56			56	586
		27 65	27 65			27 65	587
		77 63	61 64			61 64	588
					50	50	589
	6 39	113 66	113 66			113 66	590
	74 24	121 25	111 25			111 25	591
		164 50	88 20	75	1 30	164 50	592
							593
		90 68	137 36			137 36	594
							595
			265 78			265 78	596
		156	156			156	597
		600	410 57	189	40 66	620 23	598
				500		500	599
202 50	50 35	429 72	140 77	120	143 62	404 39	600
40	55 06	95 06	20	40 75	34 31	95 06	601
	29 25	79 42	71 62			71 62	602
		350	235			235	603
	6 50	13 50	13 50			13 50	604
	6 10	1,112 10	46 35	201	248 08	495 43	605
	51 79	2,466 18	1,462 20	600	427 35	2,489 55	606
		218 19	60 10	50		110 10	607
			20			20	608
		75	75			75	609
							610
	30	190	53 85			53 85	611
		74 61	74 61			74 61	612
	302 34	1,502 34	201 76	104	300	605 76	613
							614
							615

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to Univ. r sity
616	Poughkeepsie	Hudson River st. hosp. med. lib. ....	.....	.....	..
617	"	Hudson River st. hosp. patients lib. ....	.....	.....	..
618	"	Poughkeepsie lib.	1843	L	..
619	"	Vassar coll. lib.	1861	I	i
620	Prattburg	Franklin acad. and nn. sch. lib.	1823	I	i
621	Pulaski	Pulaski acad. and un. sch. lib. ....	.....	I	i
622	Randolph	Helen Culver lib. Chamberlain inst.	1855	I	ir
623	Red Hook	Union sch. lib. ....	.....	I	i
624	Rhinebeck	Starr inst. lib.	1862	I	..
625	"	Union sch. lib.	1869	I	i
626	Richfield Springs	Union sch. lib.	1886	I	i
627	Riverhead	Union sch. lib. ....	.....	I	i
628	Rochester	Central lib.	1862	.....	..
629	"	Court of appeals lib.	1849	L	..
630	"	Fem. acad. of Sacred Heart lib. ....	.....	I	i
631	"	Nazareth acad. lib.	1873	I	i
632	"	Reynolds lib.	1884	L	..
633	"	Rochester free acad. lib.	1857	I	i
634	"	Rochester theo. sem. lib.	1851	I	i
635	"	Univ. of Rochester lib.	1850	I	i
636	"	Wagner mem. Lutheran coll. lib.	1882	I	i
637	Rockville Center	Rockville Center pub. lib.	1894	R	o
638	Rome	Jervis lib. ass'n.	1894	G	a
639	"	St Peter's acad. lib.	1873	I	i
640	"	Y. M. C. A. lib.	1872	I	r
641	Rondout	Ponckhockie pub. lib.	1895	R	o
642	"	Ulster acad. lib.	1881	I	i
643	Roslyn	Bryant circ. lib.	1878	G	..
644	Round Lake	Round Lake inst. lib.	1890	I	..
645	Rouse Point	Union sch. lib. ....	.....	I	i
646	Roxbury	Roxbury lib. ass'n.	1893	.....	..
647	Rushford	Union sch. lib.	1852	I	i
648	Sacket's Harbor	Sacket union sch. lib.	1896	I	i
649	Sag Harbor	Union sch. lib. ....	.....	I	i
650	St Johnsville	Union sch. lib.	1889	I	i
651	St Regis Falls	Union sch. lib.	1891	I	i
652	Salamanca	Union sch. lib. ....	.....	I	i
653	Salem	Baneroft pub. lib.	1891	L	r
654	"	Washington acad. lib.	1891	I	i
655	Sandy Creek	High sch. lib.	1872	I	i
656	Sandy Hill	Union sch. lib.	1871	I	i
657	Saranac Lake	Union sch. lib.	1893	I	i
658	Saratoga Springs	4th jud. dist. law lib. ....	.....	.....	..
659	"	St Faith's sch. lib.	1892	I	i
660	"	Saratoga athenaeum lib.	1885	G	..

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
Henrietta Lounsbury	Med.	Gov.	St.	Fl		13	347 616
Henrietta Lounsbury		Gov.	St.	Fl		54	685 617
J. C. Sickley		Pub. sch.	Tax.	F		a 785	a 19,748 618
Frances A. Wood		Coll.	Gen.	Fl	341	1643	24,132 619
		Pub. sch.	Tax. St.	F		89	1989 620
		Sch.	Gen.	Fl			800 621
E. A. Bishop		Sch.	End. St. G	F			1740 622
		Pub. sch.	Tax.	Fl			300 623
W. I. Miller		Inst.	End. Gen.	F		148	4368 624
		Pub. sch.	Tax. St.	F		14	678 625
J. A. Bassett		Pub. sch.	Tax. St.	Fl		42	751 626
G. A. Brown		Pub. sch.	Tax. St.	Fl		143	654 627
Milton Noyes		Pub. sch.	Tax. St.	F	62	3495	29,000 628
E. D. Jones	Law	Gov.	St.	R		506	17,000 629
		Sch.	Gen.	Fl			1450 630
Ursula Murphy		Sch.	Gen.	Fl	31	176	3000 631
A. S. Collins		End.	End.	F	b 736	b 1778	b 33,451 632
J. G. Allen		Pub. sch.	Tax. St.	R. Fl.			2340 633
Howard Osgood		Coll.	End.	Fl	87	538	28,659 634
A. L. Baker		Coll.	End.	R. Fl.	436	627	30,763 635
		Coll.	Gen.	Fl	15		700 636
E. S. Redman		Pub. D.	St. G	F		113	1581 637
M. Elizabeth Beach		End.	End. T. St.	F	960	333	10,577 638
Sister Holy Family		Sch.	Gen.	Fl	6	44	990 639
J. H. Irons		Inst.	Gen.	R	† 100	† 36	3000 640
W. A. McConnell		Pub. D.	Tax. St.	F		113	943 641
Adolf Schaublin		Pub. sch.	Tax. St.	F	7	321	1443 642
		Mem.	G	S	2		1027 643
Ja. E. Weld		Sch.	G. Gen.	F	2015	10	2025 644
L. R. Bawdish		Pub. sch.	Tax. St.	Fl		100	400 645
Mrs Tupper		Mem.	G. Fees.	S.	290	15	786 646
H. J. Walter		Pub. sch.	Tax.	F			313 647
E. A. Chick		Pub. sch.	Tax. St.	Fl		121	416 648
		Pub. sch.	Tax.	Fl			350 649
F. Yale Adams		Pub. sch.	Tax. St.	Fl	2	16	682 650
Alex. Macdonald		Pub. sch.	Tax. St.	F		100	700 651
May Connor		Pub. sch.	Tax. St.	F	86	32	1363 652
Frances F. Leighton		End.	End. T. St.	F	14	260	4274 653
		Sch.	End. Gen.	F			1130 654
R. H. Snyder		Pub. sch.	Tax. St.	F			750 655
Emily M. Stover		Pub. sch.	Tax. St.	F	6	166	1423 656
Tibbitts Walker		Pub. sch.	Tax. St.	Fl		† 100	† 290 657
Corliss Sheldon	Law	Gov.	St.	R		† 200	† 3800 658
		Sch.	Gen.	Fl			† 1548 659
Elizabeth Brazee		Mem.	Fees	S.		150	† 5000 660

a For year ending Dec. 31, 1895.

b " " " Sept. 30, 1896.

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
616								
617								
618	40,485	8014	306	60	60		\$3675 67	
619			255	12	15			
620	395		200	2	30		25 25	\$13
621								
622	1600	175	261	36	39	\$60		
623								
624	7140		208	45	45	1024 31		
625	?	?	188	30			17 97	12 03
626	450		185	2	30		33 75	33 75
627	1520		40	2				81 59
628	104,115	?	277	54	54		5700	1000 27
629			300		60			
630								
631	280	?	300	20	20	641 05		
632	119021	7105	340	72	76	23,170 89		
633			192		25		123 54	123 54
634	?	?	308	35½	35½			
635	?	?	290	39	39	1250		
636		?	270		35			
637	6450		156	4	4			50
638	40,162	?	295	48½	48½	878 54	1000	200
639	200	490	200	2				
640	931		310	78	78			
641	4030		88	3			50	50
642	3131		210	30			150	150
643	187		104	12	172	860		
644			192	35				
645		290	200		30		100	
646	1926	?	312	42	45			
647	58		196	5				
648			43				174 01	25
649								
650	666	1325	190	30	30		11 77	11 77
651	600	100	179	5			25	25
652	4396	?	36	5	25		150	150
653	6355	218	150	15	15	1476 97		
654								
655	250	100	200	30	30			
656	3046	186	51	2½			100	125
657	?	?	1179	130	130		50	100
658								
659								
660	19000	?	300	48	48			

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	.....	.....	.....	.....	.....	.....	616
.....	.....	.....	.....	\$35	.....	\$35	617
.....	.....	\$3,675 67	\$967 55	1,912 46	\$795 66	3,675 67	618
.....	.....	.....	.....	.....	.....	.....	619
.....	.....	38 25	38 25	.....	.....	38 25	620
.....	.....	.....	.....	.....	.....	.....	621
.....	.....	60	166 65	.....	.....	166 65	622
.....	.....	.....	.....	.....	.....	.....	623
.....	.....	1,024 31	154 78	314 03	630 76	1,099 57	624
.....	.....	30	30	.....	.....	30	625
.....	.....	.....	.....	.....	.....	.....	626
.....	.....	67 50	67 50	.....	.....	67 50	627
.....	.....	81 59	.....	.....	.....	81 59	628
\$76 20	.....	6,778 47	3,083 37	2,700	59 69	5,483 06	629
.....	.....	.....	.....	12,000	.....	12,000	630
.....	.....	.....	.....	.....	.....	.....	631
12	\$36	689 05	684 80	.....	4 25	689 05	632
.....	376 02	23,546 91	4,244 71	4,799 02	10,412 92	19,456 65	633
.....	.....	247 08	247 08	.....	.....	247 08	634
.....	.....	.....	2,052 46	.....	1,227 78	3,280 24	635
.....	2,138 42	3,388 42	2,116 36	800	572 06	3,488 42	636
.....	.....	.....	.....	.....	.....	.....	637
.....	136 58	186 59	106 37	65	3 75	175 12	638
.....	98 68	2,177 22	1,466 03	1,121 40	1,732 53	4,319 96	639
38 50	.....	38 50	40	.....	.....	40	640
.....	112	112	112	.....	.....	112	641
.....	.....	100	100	.....	.....	100	642
.....	.....	300	300	.....	.....	300	643
21	188 62	218 62	34 75	.....	262 75	297 50	644
.....	.....	100	100	.....	.....	100	645
.....	.....	.....	.....	.....	.....	.....	646
.....	.....	.....	.....	.....	.....	.....	647
.....	.....	199 01	199 01	.....	.....	199 01	648
.....	.....	.....	.....	.....	.....	.....	649
.....	.....	23 54	23 54	.....	.....	23 54	650
.....	.....	.....	.....	.....	.....	.....	651
.....	.....	50	50	.....	.....	50	652
.....	.....	300	202 10	18	.....	220 10	653
.....	55 60	1,532 57	390 39	446	1,257 99	2,094 35	654
.....	.....	.....	.....	.....	.....	.....	655
.....	.....	.....	.....	.....	.....	.....	656
.....	32 77	257 77	176 41	51	3 47	230 88	657
.....	.....	150	100	.....	.....	100	658
.....	.....	.....	.....	.....	.....	.....	659
700	200	900	270	300	275	845	660

NEW YORK

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
661	Saratoga Springs	Saratoga Spr. pub. lib.	1867	L	...
662	" "	Temple Grove sem. lib. ....	.....	I	i
663	" "	Union sch. lib.	1867	I	i
664	Saugerties	Saugerties pub. lib.	1894	R	o
665	"	Union sch. lib.	1894	I	i
666	Saugus	Union sch. lib.	1843	I	i
667	Savannah	Union sch. lib.	1892	I	i
668	Savona	Union sch. lib.	1893	I	i
669	Sayville	Union sch. lib.	?	I	i
670	Schaghticoke	Union sch. lib.	1896	I	i
671	Schenectady	Schenectady free pub. lib. ass'n	1894	R	c
672	"	Union class. inst. lib.	1855	I	i
673	"	Union coll. lib.	1795	I	i
674	"	Walter C. Swart private lib.	1890	.....	.....
675	Schenenvus	Union sch. lib.	1880	I	i
676	Schoharie	Union sch. lib.	1835	I	i
677	Schuylerville	Union sch. lib.	?	I	i
678	Sea Cliff	Sea Cliff pub. lib.	1895	R	c
679	Seneca Falls	Mynderse acad. lib.	1867	I	i
680	" "	Seneca Falls lib. ass'n	1891	L	...
681	Sharon Springs	Union sch. lib.	1895	I	i
682	Sherburne	Sherburne pub. lib.	1895	R	c
683	"	Union sch. lib.	1866	I	i
684	Sherman	Union sch. lib.	1869	I	i
685	Shortsville	Myron M. Buck free lib.	1890	.....	.....
686	"	Union sch. lib. ....	.....	I	i
687	Sidney	Sidney pub. lib.	1895	R	c
688	"	Union sch. lib. ....	.....	I	i
689	Silver Creek	Union sch. lib.	1840	I	i
690	Sinclairville	Sinclairville free lib.	1894	R	c
691	"	Sinclairville ladies lib.	1889	G	...
692	"	Union sch. lib.	1888	I	i
693	Sing Sing	Mt Pleasant acad. lib.	1820	I	i
694	" "	Sing Sing pub. lib.	1893	R	c
695	" "	State prison lib. ....	.....	.....	.....
696	" "	Union sch. lib. ....	.....	I	i
697	Skaneateles	Skaneateles lib. ass'n	1877	L	...
698	"	Union sch. lib.	?	I	i
699	Smithville Flats	Smithville un. sch. lib.	?	I	i
700	Sodus	Sodus acad. lib.	1852	I	i
701	Solvay	Union sch. lib.	1894	I	i
702	Somers	Somers lib.	1875	.....	.....
703	South Glens Falls	Union sch. lib.	?	I	i
704	South New Berlin	Union sch. lib.	1875	I	i
705	Southampton	Rogers mem. lib.	1893	G	a

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
T. R. Kneil.....		Pub. sch.	Tax.....	F.....		149	2337 661
.....		Sch.....	Gen.....	Fl.....			1634 662
.....		Pub. sch.	Tax.....	F.....			430 6-3
Fred N. Moulton.....		Pub. D.....	Tax. St..	F.....	40	435	1799 664
Fred N. Moulton.....		Pub. sch.	Tax. St..	Fl.....	5	51	1037 665
E. C. Miller.....		Pub. sch.	Tax. St..	F.....		15	400 666
H. N. Tolman.....		Pub. sch.	Tax. St..	F.....		162	726 667
A. D. Miller.....		Pub. sch.	Tax. St..	F.....	2	10	407 668
.....		Pub. sch.	Tax. St..	Fl.....	3	43	482 669
C. W. Dunn.....		Pub. sch.	Tax. St..	Fl.....			300 670
Henry Glen.....		Mem.....	Tax. St..	F.....	3233	672	3905 671
C. S. Halsey.....		Pub. sch.	Tax. St..	Fl.....	2	1	537 672
W. Lamoroux.....		Coll.....	Gen.....	Fl.....	118	112	29,217 673
Walter C. Swart.....		Pri.....	G.....	Pri.....		97	456 674
Anna Lane.....		Pub. sch.	Tax. St..	Fl.....	4		385 675
Solomon Sias.....		Pub. sch.	Tax. St..	F.....		109	862 676
M. E. Carpenter.....		Pub. sch.	Tax. St..	Fl.....	4	18	790 677
J. Forster.....		Mem.....	St. G.....	F.....	67	54	650 678
.....		Pub. sch.	Tax. St..	Fl.....		13	1517 679
Mary H. Fairchild.....		Mem.....	G. Fees.	R. S.	58	74	2813 680
J. Van Schaick jr.....		Pub. sch.	Tax. St..	F.....	140	15	601 681
Anna Merrihew.....		Pub. D.....	Tax. St..	F.....			990 682
Mary A. Sholes.....		Pub. sch.	Tax. St..	F.....			1022 683
Lura A. Sheldon.....		Pub. sch.	Tax. St..	F.....		103	1103 684
Mrs O. C. Buck.....		Pri.....	G.....	F.....			11500 685
W. D. Hewes.....		Pub. sch.	Tax. St..	Fl.....		32	560 686
Ethel A. Case.....		Pub. D.....	Tax. St..	F.....		243	1300 687
.....		Pub. sch.	Tax. St..	Fl.....			328 688
J. Milford McKee.....		Pub. sch.	St. Gen..	F.....	12	369	1857 689
Mrs A. E. Fife.....		End.....	St. Gen..	F.....			1450 690
H. J. Chase.....		Mem.....	G. Fees.	S.....	25	73	781 691
.....		Pub. sch.	Tax. St..	F.....			361 692
A. T. Emory.....		Sch.....	Gen.....	Fl.....			12,000 693
J. I. Gorton.....		Pub. D.....	Tax. St..	F.....	194	213	3927 694
J. C. S. Weills.....		Gov.....	St.....	Fl.....		600	5000 695
.....		Pub. sch.	Tax. St..	Fl.....			1338 696
Lydia A. Cobane.....		Mem.....	End. G.....	S.....	280	280	28535 697
H. F. Miner.....		Pub. sch.	Tax. St..	Fl.....			11558 698
A. M. Baker.....		Pub. sch.	Tax. St..	F.....		40	503 699
Lewis H. Clark.....		Sch.....	St. Gen..	Fl.....		23	301 700
C. O. Richards.....		Pub. sch.	Tax. St..	Fl.....		350	1000 701
Ruth Tompkins.....		Mem.....	G. Fees.	S.....	23	16	1555 702
J. E. Kelley.....		Pub. sch.	Tax. St..	F.....		140	394 703
Edgar R. Holmes.....		Pub. sch.	Tax. St..	Fl.....		19	364 704
E. N. Foster.....		End.....	End. G.....	F.....	950	50	1000 705

a For year ending Feb. 21 1896.

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
661	27,125		300	48			\$485 39	
662								
663								
664	8174	?	303	12	12		442 70	\$200
665	1200	?	197	40	40		38 66	33
666	200		36	1			10	6 89
667	474	?	192	?			20	50
668	220		8				20	
669	900		10				29 30	29 30
670							25	25
671	17,692	1400	250	42	48			400
672	396	300	5	25				12
673			216		57			
674	115	678	365	198	198			
675			200					
676	1300	?	195	30	30		55	55
677	92	?	162	30	30		25	25
678	2612	?	309	30	78			
679	1700		79	2	30		88 26	25
680	4716	1200	305	35	35			
681	1535		140	1			21	17 67
682	800		95	3			36 87	
683								
684	1860		200	2	30		55 47	101 65
685	6340		104	14	172			
686	200	50	100	4	8			12 30
687	4320		200	6	15		200	200
688								
689	2900		80	2				109
690	13000		156	11				
691	2550		104	12		\$9		
692		?	192					
693	1750		240	6				
694	14,158	14000	204	35	35		209 75	200
695								
696								
697	5943		305	70	70	145 75		
698	11500	?	200	1	30		25	
699	152	?	187	25			34	20
700	?	?	194	?	125			50
701	800	500	200		25		106 93	106 93
702	459	?	104	4	4			
703	265	?	200	10	25		325	25
704	130	500	170	30	30		20	
705	1640		77	39	39	360		

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	.....	\$485 39	\$230 39	\$240	\$15	\$485 39	661
.....	.....	.....	.....	.....	.....	.....	662
.....	.....	.....	.....	.....	.....	.....	663
.....	\$20 85	663 55	400 49	100	174 15	674 64	664
.....	.....	71 66	71 66	.....	.....	71 66	665
.....	.....	16 89	20	.....	.....	20	666
.....	70 43	140 43	140 43	.....	.....	140 43	667
.....	.....	20	20	.....	.....	20	668
.....	.....	58 60	62 60	.....	2	64 60	669
.....	.....	50	236 84	.....	.....	236 84	670
\$753 50	546 35	1,699 85	802 08	576 23	321 54	1,699 85	671
.....	.....	12	12	.....	.....	12	672
.....	400	400	.....	750	.....	750	673
.....	.....	.....	221	.....	.....	221	674
.....	.....	.....	.....	.....	.....	.....	675
.....	.....	110	110	.....	.....	110	676
.....	5 56	55 66	23 07	.....	.....	23 07	677
.....	389 56	389 56	102 90	180	283 67	566 57	678
.....	.....	113 26	53 26	50	.....	103 26	679
224	496 87	720 87	144 84	156	263 08	563 92	680
.....
.....	12	50 67	50	.....	.....	50	681
.....	.....	36 87	.....	14	22 87	36 87	682
.....	.....	.....	.....	.....	.....	.....	683
.....	5	162 12	162 12	.....	.....	162 12	684
.....	.....	.....	.....	.....	25	25	685
.....	.....	12 30	36 41	.....	.....	36 41	686
.....	60	460	347 70	37 65	76 66	462 01	687
.....	.....	.....	.....	.....	.....	.....	688
.....	85	194	437 58	.....	291	440 49	689
.....	10	10	.....	60	.....	60	690
.....
.....	72 50	81 50	78 75	25	.....	103 75	691
.....	.....	.....	.....	.....	.....	.....	692
.....	.....	.....	.....	.....	.....	.....	693
.....	4	413 75	239 30	150	24 45	413 75	694
.....	.....	.....	.....	.....	.....	.....	695
.....	.....	.....	.....	.....	.....	.....	696
467	500 35	1113 13	202 11	720	291 48	1213 59	697
.....	.....	25	915	.....	.....	915	698
.....	20	74	74	.....	.....	74	699
.....	50	100	100	.....	.....	100	700
.....
.....	.....	213 86	213 86	.....	.....	213 86	701
22 50	108	130 50	19 35	9	11 90	40 25	702
.....	.....	350	.....	.....	.....	.....	703
.....	.....	20	19 50	.....	50	20	704
.....	5250	5610	78	50	170	298	705

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
706	Southampton	Union sch. lib.	1850	I	i
707	Spencer	Union sch. lib.	1875	I	i
708	Springfield Center	Springfield free lib.	1895	R	c
709	Springville	Griffith inst. & un. sch. lib.	?	I	i
710	"	Springville pub. lib.	1893	R	c
711	Stamford	Stamford sem. & un. sch. lib.	1869	I	i
712	Stanfordville	Christian biblical inst. lib.	1868	I	i
713	Stapleton	A. Winter mem. lib. Staten I. acad.	1886	I	i
714	Stillwater	Union sch. lib.	1873	I	i
715	Syracuse	Acad. of Sacred Heart lib.	1887		
716	"	Court of appeals lib.			
717	"	High sch. lib.	?	I	i
718	"	St John cath. acad. lib.	1887	I	i
719	"	Syracuse central lib.	1855	R	c
720	"	Syracuse univ. lib.	1872	I	i
721	"	Syracuse univ. coll. of med. lib.	1872	I	i
722	"	Y. M. C. A. R. R. branch lib.	1880		
723	Tarrytown	Tarrytown lyceum pub. lib.	1895	I	r
724	"	Union sch. lib. dist. no. 1 (Greenburg) ..		I	i
725	Theresa	Union sch. lib.	1893	I	i
726	Ticonderoga	Union sch. lib.	1888	I	i
727	Tompkinsville	Sch. lib. dist. no. 1. (Middletown) ..	1872	I	...
728	Tonawanda	Tonawanda pub. lib.	1893	R	c
729	"	Union sch. lib.		I	i
730	Tottenville	Union sch. lib.		I	i
731	Troy	Catholic male orphan asylum lib.	1864	I	...
732	" 4th st. c. State ...	Children's neighborhood lib.	1894	R	c
733	"	High sch. lib.	1863	I	i
734	"	LaSalle inst. lib.	1878	I	i
735	"	Marshall infirmary lib.	1858	I	...
736	"	Rensselaer polytechnic inst. lib.	1824	I	i
737	"	St Joseph's acad. lib.	1896		
738	"	St Peter's acad. lib.	1886	I	i
739	"	Troy acad. lib.	1834	I	i
740	"	Troy fem. sem. lib.	1821	I	i
741	"	Y. M. A. lib.	1835	I	...
742	"	Y. W. A. lib.	1895	I	i
743	Trumansburg	Trumansburg pub. lib.	1893	R	c
744	Truxton	Union sch. lib.	1894	I	i
745	Tully	Union sch. lib.	1895	I	i
746	Unadilla	Union sch. lib.	1850	I	i
747	Union	Union sch. lib.	?	I	i
748	Union Springs	Oakwood sem. lib.	1858	I	i
749	"	Union sch. lib.	1872	I	i
750	Utica	Mrs Piatt's sch. lib.	1875		

LIBRARIES (continued)

Name of Librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
F. A. Johnson.....	Pub. sch.	Tax. St.	F1 ..	.....	257	964 706
S. K. Marsh.....	Pub. sch.	Tax. St.	F1 ..	.....	2	520 707
W. F. Brington.....	Mem.....	St. G.....	F.....	7	220	227 708
R. W. Hughes.....	Pub. sch.	Tax. St.	F1 ..	.....	117	1277 709
John S. Vedder.....	Pub. D..	Tax. St.	F.....	.....	430	2180 710
Hattie F. Hubbell.....	Pub. sch.	Tax. St.	F.....	1	208	2484 711
Lester Howard.....	Sch.....	Gen.....	F1 ..	.....	15	2265 712
.....	Sch.....	St. G.....	F.....	.....	.....	5850 713
E. Hinman.....	Pub. sch.	Tax. St.	F.....	.....	60	1040 714
.....	Sch.....	St. Fees.	F1. S.	.....	1430	13500 715
T. R. Morgan.....	Law	Gov.....	St.....	F1 ..	.....	525	19,200 716
M. Louise Pattison.....	Pub. sch.	Tax. St.	F1 ..	58	187	2088 717
Mary Cronin.....	Sch.....	Gen.....	F1 ..	40	260	1650 718
Ezekiel W. Mundy.....	Pub.....	Tax. St.	F.....	318	4058	28,000 719
Henry O. Sibley.....	Coll.....	Gen.....	R.....	1234	409	39,508 720
F. W. Marlow.....	Med.	Coll.....	Gen.....	F1 ..	1000	.....	12200 721
A. D. Roberts.....	Inst.....	Gen.....	F1 ..	5	3	475 722
M. L. Bacon.....	Inst.....	St. G.....	F.....	39	240	2943 723
E. Carpenter.....	Pub. sch.	Tax. St.	F.....	.....	84	2453 724
Mrs W. C. Porter.....	Pub. sch.	Tax. St.	F.....	.....	110	450 725
E. J. Owen.....	Pub. sch.	Tax.....	F.....	.....	1	625 726
N. F. Standerwick.....	Pub. sch.	Tax. St.	F.....	.....	.....	891 727
Mrs F. J. Diamond.....	Pub. D..	Tax. St.	F.....	11	229	1750 728
.....	Pub. sch.	Tax. St.	F1 ..	.....	.....	300 729
N. J. Lowe.....	Pub. sch.	Tax. St.	F.....	.....	60	375 730
.....	Inst.....	Gen.....	F1 ..	12	.....	734 731
Clara E. Staude.....	Mem.....	St. G.....	F.....	14	123	790 732
H. L. Taylor.....	Pub. sch.	Tax. St.	F1 ..	.....	.....	640 733
.....	Sch.....	St. G.....	F1 ..	37	39	1911 734
Joseph D. Lomax.....	Inst.....	Gen.....	F1 ..	.....	3	1753 735
John H. Peck.....	Coll.....	Gen.....	F1 ..	132	.....	6000 736
Sr. Agnes.....	Sch.....	G. Gen.	F1 ..	100	600	700 737
Sr. Mary.....	Sch.....	St. G.....	F1 ..	10	26	716 738
Maxey & Barnes.....	Sch.....	Gen.....	F1 ..	1	1	1075 739
Emily S. Wilcox.....	Sch.....	Gen.....	F1 ..	.....	108	2333 740
DeWitt Clinton.....	Inst.....	End.....	F.....	.....	.....	130,000 741
Kate A. Farnham.....	Inst.....	St. Gen.	F.....	42	118	1450 742
E. E. Scribner.....	Pub. D..	Tax. St.	F.....	.....	8	832 743
F. J. Bierce.....	Pub. sch.	Tax. St.	S.....	42	70	692 744
W. E. Stilwell.....	Pub. sch.	Tax. St.	F1 ..	.....	116	300 745
Mrs O. E. Blanding.....	Pub. sch.	Tax. St.	F1 ..	.....	170	646 746
J. S. Lusk.....	Pub. sch.	Tax. St.	F.....	21	70	852 747
Elijah Cook.....	Sch.....	Gen.....	F1 ..	.....	75	2160 748
Billa A. Yawger.....	Pub. sch.	Tax. St.	F.....	.....	.....	600 749
.....	Sch.....	Gen.....	F1 ..	.....	.....	6000 750

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
706	-----	8450	169	-----	40	-----	\$126 96	\$179 70
707	650	↑	190	1	30	-----	-----	-----
708	1329	-----	313	84	-----	-----	-----	130
709	↑	-----	200	30	30	-----	57 32	57 32
710	8514	-----	308	6	6	-----	200	200
711	412	-----	104	1½	-----	-----	25	25
712	-----	-----	175	25	↑	-----	-----	-----
713	-----	-----	-----	-----	-----	-----	-----	-----
714	1788	-----	80	3	-----	-----	29 34	25
715	↑1200	↑430	↑200	15	↑30	-----	-----	500
716	-----	-----	-----	-----	-----	-----	-----	-----
717	250	↑708	200	30	15	-----	50	185 76
718	-----	1650	195	5	15	-----	-----	-----
719	91,795	↑20,000	368	↑56	↑69	-----	10,500	734 39
720	925	↑	312	54	78	-----	-----	-----
721	-----	-----	197	↑	-----	-----	-----	-----
722	140	25	300	12	12	-----	-----	-----
723	6353	↑	300	-----	-----	-----	-----	200
724	3500	-----	84	3	-----	-----	175	35 58
725	-----	-----	120	6	-----	-----	60	60
726	254	68	189	3	35	-----	-----	-----
727	950	-----	38	-----	-----	-----	11 33	10
728	2463	↑300	260	10	-----	-----	300	200
729	-----	-----	-----	-----	-----	-----	-----	-----
730	2000	-----	40	1	-----	-----	25	25
731	-----	360	52	1	-----	-----	-----	-----
732	6021	6	305	24	24	-----	-----	50
733	↑	↑	200	20	-----	-----	-----	-----
734	↑900	↑2100	193	30	-----	-----	-----	-----
735	-----	-----	365	-----	-----	-----	-----	-----
736	34	↑30	97½	39	39	-----	-----	-----
737	350	500	185	4	5	-----	-----	-----
738	↑400	↑150	237	10	5	-----	-----	-----
739	↑	↑	185	↑25	↑25	-----	-----	-----
740	-----	-----	200	-----	40	-----	-----	-----
741	53,192	18,500	807	6	61	8298 81	-----	-----
742	2987	-----	310	30	64	-----	-----	50
743	2480	-----	130	3	35	-----	14 42	-----
744	↑	↑	165	6	-----	-----	25	25
745	763	-----	38	1	-----	-----	-----	-----
746	1875	-----	45	2½	-----	-----	97 50	97 50
747	709	↑	190	30	30	-----	55 85	49 69
748	300	-----	210	60	-----	-----	-----	-----
749	↑750	↑500	160	1	20	-----	-----	69
750	-----	-----	200	-----	↑	-----	-----	-----

LIBRARIES (continued)

FROM		Total receipts	PAYMENT FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	.....	\$306 66	\$306 66	.....	.....	\$306 66	706
.....	.....	.....	8 80	\$10	.....	18 80	707
.....	\$130	260	216	.....	\$44	260	708
.....	.....	114 64	114 64	.....	.....	114 64	709
.....	.....	400	400	.....	.....	400	710
.....	4 65	54 65	50	15 90	1 14	67 04	711
.....	100	100	100	.....	.....	100	712
.....	.....	.....	.....	.....	.....	.....	713
.....	.....	54 34	54 34	10	.....	64 34	714
\$100	600	† 1200	† 1100	.....	† 100	† 1200	715
.....	.....	.....	.....	1800	.....	1800	716
.....	70 50	306 26	235 76	140	.....	375 76	717
.....	360	300	.....	.....	.....	.....	718
.....	.....	11,234 39	7,035 71	4237 64	1393 02	12,666 37	719
.....	3808 26	3808 26	1137 65	2187 07	483 54	3808 26	720
.....	.....	.....	.....	.....	.....	.....	721
.....	7	7	10	.....	.....	10	722
.....	363 69	563 69	313 70	.....	163 05	476 75	723
.....	.....	210 58	87 12	100	.....	187 12	724
.....	22	120 22	106 68	40	.....	146 68	725
.....	.....	.....	.....	.....	.....	.....	726
.....	.....	21 33	.....	.....	.....	.....	727
.....	.....	500	370 48	.....	100	470 48	728
.....	.....	.....	.....	.....	.....	.....	729
.....	.....	50	30	.....	5	35	730
.....	.....	.....	.....	.....	.....	.....	731
.....	222 23	272 23	129 70	156	59 19	344 89	732
.....	.....	.....	.....	.....	.....	.....	733
18	.....	18	40 85	.....	.....	40 85	734
.....	.....	.....	10	.....	.....	10	735
.....	.....	.....	.....	.....	.....	.....	736
.....	.....	.....	504	.....	.....	504	737
.....	.....	.....	33 92	.....	.....	33 92	738
.....	† 50	† 50	† 50	.....	.....	† 50	739
.....	.....	.....	246 29	.....	.....	246 29	740
.....	.....	8298 81	.....	.....	.....	6060 21	741
.....	61 93	111 93	111 94	.....	3 45	115 39	742
.....	.....	14 42	56	.....	.....	56	743
.....	.....	50	50	.....	.....	50	744
.....	.....	.....	64 40	.....	.....	64 40	745
.....	.....	195	195	.....	.....	195	746
.....	7	112 54	56 89	.....	2 15	59 04	747
.....	.....	.....	.....	.....	.....	.....	748
.....	.....	69	.....	.....	.....	.....	749
.....	.....	.....	.....	.....	.....	.....	750

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
751	Utica	Oneida hist. soc. lib.	1876	I	...
752	"	Utica cath. acad. lib.	1891	I	i
753	"	Utica free acad. lib. ....	.....	I	i
754	"	Utica pub. lib.	1893	R	c
755	"	Utica state hosp. med. lib.	1843	I	...
756	Valatie	Union sch. lib. ....	.....	I	i
757	Van Etten	Union sch. lib. ....	.....	I	i
758	"	Van Etten pub. lib.	1895	R	c
759	Vernon	Union sch. lib.	1839	I	i
760	"	Vernon pub. lib.	1894	R	c
761	Verona	Union sch. lib.	1896	I	i
762	Victor	Union sch. lib.	1891	I	i
763	Walden	Union sch. lib.	?	I	i
764	Walton	Union sch. lib.	1853	I	i
765	Wappingers Falls	Grinnell lib. ass'n.	1867	G	...
766	"	School lib. dist. no. 2. ....	?	.....	...
767	Warrensburg	Union sch. lib.	1860	I	i
768	Warsaw	Union sch. circ. lib.	?	I	i
769	"	Union sch. reference lib.	1892	I	i
770	Warwick	Warwick inst. lib.	1847	I	i
771	Waterford	Union sch. lib. ....	.....	I	i
772	Waterloo	Union sch. lib. ....	.....	I	i
773	Waterport	Union sch. lib.	1887	I	i
774	Watertown	High sch. lib. ....	.....	I	i
775	"	Y. M. C. A. lib.	1869	.....	...
776	Waterville	Union sch. lib. ....	.....	I	i
777	"	Waterville pub. lib.	1874	R	c
778	Watkins	Watkins pub. lib.	1895	R	c
779	Waverly	High sch. lib.	?	I	ir
780	Webster	Union sch. lib.	1876	I	i
781	Weedsport	Union sch. lib.	1877	I	i
782	Wellsville	Union sch. lib. ....	.....	I	i
783	"	Wellsville pub. lib.	1894	R	c
784	West Albany	Y. M. C. A. R. E. branch lib.	1877	.....	...
785	West Point	U. S. mil. acad. lib.	1802	.....	...
786	West Troy	Watervliet arsenal post lib.	1840	.....	...
787	West Winfield	West Winfield free lib. ....	.....	R	c
788	Westbury	Greenwood free lib.	1882	R	c
789	Westchester	Sacred Heart acad. lib.	1853	I	...
790	Westfield	Westfield acad. and un. sch. lib.	1868	I	i
791	Westport	Union sch. lib.	1865	I	i
792	"	Westport lib. ass'n.	1885	G	a
793	White Plains	White Plains acad. lib.	?	I	i
794	Whitehall	Union sch. lib.	?	I	i
795	Whitesboro	Union sch. lib.	1892	I	i

LIBRARIES (continued)

Name of Librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
M. M. Bagg.....	Hist.	Mem....	G.....	R....	64	.....	6450 751
Ellen M. W. Kernan.....	Sch.....	Gen.....	Fl....	.....	15	1735 752
.....	Pub. sch.	Tax.....	Fl....	.....	.....	1225 753
Caroline M. Underhill.....	Pub.....	Tax. St.	F....	430	2627	21,187 754
.....	Med.	Inst.....	St.....	Fl....	.....	.....	6388 755
O. B. Sylvester.....	Pub. sch.	Tax. St.	F....	.....	.....	1169 756
.....	Pub. sch.	Tax.....	Fl....	.....	.....	364 757
G. T. Miller.....	Pub. D....	Tax. St.	F....	.....	100	290 758
E. R. Adams.....	Pub. sch.	Tax. St.	Fl....	.....	127	802 759
Frank Stuhlman.....	Mem.....	St. S....	F....	8	153	161 760
Helen S. Merry.....	Pub. sch.	Tax. St.	Fl....	137	38	427 761
.....	Pub. sch.	Tax. St.	F....	.....	15	1027 762
D. C. Dominick.....	Pub. sch.	Tax. St.	F....	130	.....	1100 763
J. E. Fairgrieve.....	Pub. sch.	Tax. St.	Fl....	.....	291	1850 764
E. A. Howarth.....	Mem. End	End. Fees	R. S.	32	108	5780 765
S. Mansfield.....	Pub. sch.	Tax. St.	Fl....	.....	4	395 766
B. F. Record.....	Pub. sch.	Tax. St.	R. Fl.	10	.....	1060 767
Ella Cameron.....	Pub. sch.	Tax. St.	F....	14	179	3350 768
Irving B. Smith.....	Pub. sch.	Tax. St.	Fl....	22	147	651 769
L. W. Hoffman.....	Pub. sch.	Tax. St.	Fl....	50	50	1450 770
.....	Pub. sch.	Tax. St.	Fl....	.....	.....	500 771
T. C. Wilber.....	Pub. sch.	Tax. St.	Fl....	1	109	1200 772
A. W. Behrend.....	Pub. sch.	Tax. St.	R. Fl.	.....	28	305 773
.....	Pub. sch.	Tax. St.	Fl....	.....	.....	721 774
.....	Inst.....	Gen.....	R. S.	.....	.....	1130 775
.....	Pub. sch.	Tax. St.	Fl....	.....	.....	300 776
Mary A. Smith.....	Pub. D....	E. Tax St	F....	.....	672	1830 777
F. Davis.....	Pub. D....	Tax. St.	F....	1	122	2438 778
P. M. Hull.....	Pub. sch.	Tax. St.	F....	10	303	2125 779
E. D. Webb.....	Pub. sch.	Tax. St.	Fl....	.....	12	465 780
Ira D. Brown.....	Pub. sch.	Tax. St.	F....	.....	66	404 781
Lewis W. Craig.....	Pub. sch.	Tax. St.	Fl....	10	90	700 782
Louise A. Brown.....	Pub.....	St. G....	F....	176	480	2082 783
S. F. Fraser.....	Inst.....	Gen.....	Fl....	16	38	1500 784
P. S. Michie.....	Gov.....	U. S....	R. Fl.	739	652	39,011 785
G. W. Burr.....	Gov.....	U. S....	Fl....	.....	.....	900 786
A. J. Merrell.....	Pub. D....	St. G....	F....	9	82	1503 787
Mary G. Wood.....	Pub. D....	Tax. St.	F....	.....	25	241 788
Ja. F. Denvir.....	Sch.....	Gen.....	Fl....	.....	150	1000 789
A. N. Taylor.....	Pub. sch.	Tax. St.	F....	.....	.....	2350 790
F. V. Lester.....	Pub. sch.	Tax. St.	F....	.....	11	493 791
Marie Bacon.....	Mem.....	St. G....	F....	45	30	1501 792
Emma L. Huestis.....	Sch.....	Tax. St.	Fl....	132	1198	2048 793
W. W. Howe.....	Pub. sch.	Tax. St.	F....	.....	.....	1600 794
.....	Pub. sch.	Tax. St.	Fl....	.....	.....	500 795

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
751	?	?	136	?	.....	.....	.....	.....
752	.....	.....	140	1	.....	.....	.....	.....
753	.....	.....	.....	.....	.....	.....	.....	.....
754	118,187	?	309	67	67	.....	\$8500	.....
755	.....	.....	.....	.....	.....	.....	.....	.....
756	?	.....	40	3	.....	.....	.....	.....
757	.....	.....	.....	.....	.....	.....	.....	.....
758	520	1200	1275	6	.....	.....	25	\$83 25
759	614	?	72	1	.....	.....	75	75
760	746	?	156	5	5	.....	.....	128
761	118	.....	13	1	.....	.....	20	13 50
762	.....	250	300	30	.....	.....	75	.....
763	11500	.....	1150	3	30	.....	25	115
764	1800	.....	40	1	.....	.....	137 61	125
765	6280	408	310	42	42	\$454 73	.....	.....
766	.....	?	.....	.....	.....	.....	11 31	8 03
767	1400	?	1200	5	.....	.....	.....	.....
768	16025	.....	90	7	.....	.....	179 10	150
769	.....	?	190	.....	.....	.....	76 51	25
770	3000	1000	195	1	5	.....	25	25
771	.....	.....	.....	.....	.....	.....	.....	.....
772	10	?	200	25	25	.....	96 15	25
773	544	25	36	1	.....	.....	25	25
774	.....	.....	.....	.....	.....	.....	.....	.....
775	.....	.....	312	42	72	.....	.....	.....
776	.....	.....	.....	.....	.....	.....	.....	.....
777	13450	.....	84	3	.....	60	75	.....
778	2517	.....	193	12	12	.....	200	200
779	4957	1100	250	6	6	.....	200	200
780	?	.....	80	2	.....	.....	.....	19 70
781	?	?	40	1	.....	.....	36 51	36 50
782	1122	.....	200	5	.....	.....	75	100
783	6217	1100	208	12	12	.....	.....	.....
784	5212	.....	365	98	98	.....	.....	.....
785	6457	?	313	60	60	.....	.....	.....
786	500	200	365	70	70	.....	.....	.....
787	5592	.....	215	3	3	.....	.....	.....
788	322	.....	160	30	.....	.....	5	13
789	.....	500	1200	1	6	.....	.....	.....
790	1500	.....	40	3	.....	.....	.....	.....
791	500	1000	195	15	15	.....	10	.....
792	4907	.....	136	12	12	.....	.....	25
793	3376	.....	233	10	.....	.....	630 80	25
794	11200	.....	40	14	.....	.....	.....	.....
795	.....	.....	.....	.....	.....	.....	.....	.....

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
\$402	\$100	\$502	.....	.....	\$379 06	\$279 06	751
.....	.....	.....	.....	.....	.....	.....	752
.....	.....	.....	.....	.....	.....	.....	753
.....	355 79	8855 79	\$4700 13	\$3601 65	766 73	9068 51	754
.....	.....	.....	.....	.....	.....	.....	755
.....	30	30	.....	.....	.....	.....	756
.....	.....	.....	.....	.....	.....	.....	757
.....	60 87	169 12	117 02	.....	.....	117 02	758
.....	1 99	151 99	151 14	.....	85	151 99	759
.....	128 40	256 40	196 80	.....	59 60	256 40	760
.....	.....	.....	.....	.....	.....	.....	761
.....	20 12	38 50	90	.....	.....	90	762
.....	.....	96 12	22 35	40	.....	62 35	763
.....	.....	40	.....	.....	.....	.....	764
.....	.....	262 61	262 61	.....	.....	262 61	765
169 56	101 26	725 55	254 29	180	209 82	644 11	766
.....	.....	19 34	19 34	.....	.....	19 34	767
.....	2 05	2 05	.....	.....	.....	.....	768
.....	6 50	335 60	259 60	52	24	335 60	769
.....	.....	101 51	101 51	.....	.....	101 51	770
.....	.....	50	38 08	.....	.....	38 08	771
.....	.....	.....	.....	.....	.....	.....	772
.....	1	122 15	122 15	.....	.....	122 15	773
.....	.....	50	50	.....	.....	50	774
.....	.....	.....	.....	.....	.....	.....	775
.....	.....	.....	.....	.....	.....	.....	776
.....	.....	135	554 26	35 50	103 47	693 23	777
.....	.....	400	107 01	52	205 85	364 86	778
.....	.....	400	418 87	75	84 29	528 16	779
12	.....	31 70	35 70	.....	.....	35 70	780
.....	.....	73 01	73 01	.....	.....	73 01	781
.....	.....	175	175	.....	.....	175	782
.....	293 04	293 04	360	3	32	395	783
.....	.....	50	50	.....	.....	50	784
.....	3400	3400	2000	1200	200	3400	785
.....	.....	.....	20	.....	.....	20	786
.....	44 29	44 29	36 86	.....	6 57	43 43	787
.....	8 20	26 20	23 52	.....	65	24 17	788
75	.....	75	80	.....	.....	80	789
.....	.....	.....	92 24	.....	.....	92 24	790
.....	9	19	19	.....	.....	19	791
35	242 40	302 40	54 74	89 50	53 86	198 10	792
.....	12 21	268 01	501 25	120	46 76	668 01	793
.....	.....	.....	.....	.....	.....	.....	794
.....	.....	.....	.....	.....	.....	.....	795

NEW YORK

	Place	NAME OF LIBRARY	Year founded	Source of charter	Relation to University
796	Whitney's Point.....	Union sch. lib.....	.....	I	i
797	Willard.....	Willard state hosp. lib.....	1892	I	i
798	Williamsville.....	Union sch. lib.....	.....	I	i
799	Wilson.....	Union sch. lib.....	1845	I	i
800	Windsor.....	Union sch. lib.....	1837	I	i
801	Wolcott.....	Leav'nw'th in. & Wolcott un. sch. l.	.....	I	i
802	Worcester.....	Union sch. lib.....	.....	I	i
803	Wyoming.....	Middlebury acad. & un. sch. lib....	1819	I	i
804	Yonkers.....	Woman's inst. lib.....	1880	I	i
805	".....	Yonkers pub. lib.....	1893	R	c
806	Yorkville.....	Whitestown dist. no. 3, lib.....	.....	
		Total.....	.....	
	Beirut, Syria.....	Syrian prot. coll. lib.....	1863	I	i
	Constantinople, Turkey	Robert coll. lib.....	1863	I	i

LIBRARIES (continued)

Name of librarian or person in charge	Class of books if not general	Ownership or control	Support	Terms of use	VOLUMES		
					NO. ADDED LAST YEAR		Total no. in library
					Given	Bought	
.....	Pub. sch.	Tax. St..	Fl. S.	.....	.....	396 796
W: Mabon	Inst	St	Fl .....	.....	200	1900 797
.....	Pub. sch.	Tax. St..	Fl .....	.....	.....	867 798
H. C. Hustleby	Pub. sch.	Tax. St..	F .....	.....	1	701 799
W. S. Murray	Pub. sch.	Tax. St..	F .....	.....	.....	650 800
E. D. Niles	Pub. sch.	Tax	F .....	.....	.....	483 801
.....	Pub. sch.	Tax	Fl .....	.....	.....	480 802
Mary B. Harding	Pub. sch.	Tax. St..	F .....	.....	70	1900 803
Grace Hanford	Inst	St. G. Gen	F	200	177	2663 804
Helen . Blodgett	Pub. D. .	Tax. St..	F	9	621	11,033 805
.....	Pub. sch.	G. Fees..	Fl .....	.....	48	384 806
.....	90,342	206,156	4,647,661
H. Porter	Coll	End	Fl	139	253	7651
.....	Coll	End	F .....	.....	50	6000

NEW YORK

	VOLUMES		Days open in year	HOURS OPEN EACH WEEK FOR		RECEIPTS		
	NO. ISSUED			Lending	Reading	Invested funds	Local taxation	State aid
	For home use	For use at lib.						
796	-----	-----	165	1	36	-----	-----	-----
797	-----	-----	-----	-----	-----	-----	-----	-----
798	-----	-----	35	1	-----	-----	-----	-----
799	† 3520	†	40	2	-----	-----	\$6	-----
800	145	20	48	-----	-----	-----	-----	-----
801	-----	-----	-----	-----	-----	-----	-----	-----
802	-----	-----	-----	-----	-----	-----	-----	-----
803	300	100	200	2	40	-----	25	\$25
804	7685	†	305	66	66	-----	-----	200
805	47,211	†	295	50	50	-----	2000	-----
806	-----	-----	52	1	-----	-----	9	-----
	5,008,402	-----	-----	-----	-----	-----	-----	-----
	5408	†7900	216	22	22	\$828 77	-----	-----
	1500	250	200	5	10	-----	-----	-----

LIBRARIES (continued)

FROM		Total receipts	PAYMENTS FOR			Total payments	
Annual dues	Gifts and other sources		Books, serials and binding	Salaries	All other expenses		
.....	.....	.....	.....	.....	.....	.....	796
.....	.....	.....	.....	.....	.....	.....	797
.....	.....	.....	.....	.....	.....	.....	798
.....	.....	\$6	\$6	.....	.....	\$6	799
.....	.....	.....	.....	.....	.....	.....	800
.....	.....	.....	.....	.....	.....	.....	801
.....	.....	.....	.....	.....	.....	.....	802
.....	.....	50	50	.....	.....	50	803
.....	\$581 24	781 24	240 47	\$320	\$34 86	595 34	804
\$55	304 04	2359 04	702 25	.....	224 11	926 36	805
.....	30	39	39	.....	.....	39	806
.....	.....	840,037 77	.....	.....	.....	780,855 38	.....
.....	7	335 77	548 29	213 12	50	811 41	.....
.....	75	75	75	.....	.....	75	.....

GEOGRAPHIC DISTRIBUTION OF LIBRARIES

The figures in italics and those prefixed to totals

COUNTY	Population in 1892	LIBRARIES					
		FREE			OTHER		
		No.	Volumes		No.	Volumes	
New York.....	1,180,739	13	1	350,920	70	1	1,619,013
Kings.....	299,276	5	2	103,531	18	3	260,695
Queens.....	8141,807	13	14	24,352	11	28	10,450
Suffolk.....	2063,572	4	52	3,383	11	20	15,301
Richmond.....	2553,452	3	41	7,116	1	52	1,080
Westchester.....	7145,106	13	5	44,792	9	15	24,640
Rockland.....	4333,726	4	40	7,120	2	50	1,725
Vicin. N. Y. city...	21,432,939	6	42	8190,294	5	52	313,891
Orange.....	1197,760	9	6	41,336	13	8	58,955
Putnam.....	5914,230	3	51	3,520	2	38	4,742
Dutchess.....	1678,342	6	11	27,861	13	9	53,897
Ulster.....	1287,652	6	37	7,857	2	42	3,933
Sullivan.....	4731,860	1	57	1,106	1	56	612
Delaware.....	3445,488	7	27	9,781	4	46	3,361
Greene.....	4931,141	5	49	4,248	2	51	1,375
Columbia.....	3545,205	8	23	12,616	3	45	3,407
So. E. counties....	7431,678	8	45	6108,325	7	40	8130,232
Rensselaer.....	9128,923	8	8	38,777	11	19	16,662
Albany.....	5167,289	4	28	9,715	24	2	286,752
Schenectady.....	2457,301	1	50	3,995	3	13	30,210
Schoharie.....	4234,194	3	55	2,089	.....	.....	.....
Montgomery.....	3346,081	6	34	8,507	6	34	6,908
Fulton.....	3938,478	3	15	21,703	1	53	764
Saratoga.....	1386,254	9	31	9,429	8	23	14,665
Washington.....	3246,458	9	20	16,210	4	44	3,595
Mid. E. counties....	4604,978	4	43	5110,335	4	57	2359,536
Warren.....	5428,618	3	33	8,525	3	35	6,521
Hamilton.....	605,216	.....	.....	.....	.....	.....	.....
Essex.....	4633,110	10	21	14,222	6	40	4,378
Clinton.....	3146,601	2	56	1,618	4	37	5,567
Franklin.....	3839,817	4	38	7,531	4	47	2,339
St. Lawrence.....	5626,542	5	29	9,595	11	14	25,051
Jefferson.....	1870,358	7	45	5,726	6	39	4,716
Lewis.....	5130,248	2	48	4,709	1	57	567
North. counties....	9280,510	7	33	951,926	8	35	949,139
Herkimer.....	2947,491	8	16	20,916	4	33	6,927
Oneida.....	10123,756	14	3	76,941	17	12	32,179
Madison.....	3742,206	6	35	8,385	8	10	36,287
Onondaga.....	6150,808	8	9	35,362	15	7	83,976
Oswego.....	1770,970	6	26	10,045	7	17	21,878
Cayuga.....	2162,816	8	7	40,702	8	18	17,028
Seneca.....	5816,861	.....	.....	.....	5	30	8,189
N. cen. counties...	514,908	1	50	2192,351	2	64	6206,464

AND COMPARATIVE CIRCULATION BY COUNTIES

show the rank of each county or section.

TOTAL		Volumes per 1000 population	CIRCULATION OF FREE LIBRARIES		
No.	Volumes		Total	Per 1000 population	Per 100 volumes
7 83	1 1 1,969,933	1 5 1093	1 1 1,516,711	1 11 841	1 6 432
23	2 364,226	35 356	2 489,862	28 491	2 473
24	18 34,802	49 238	23 28,785	44 203	47 118
15	32 18,684	41 293	51 4,031	55 63	46 119
4	49 8,196	55 153	53 2,950	54 55	56 41
22	11 69,432	24 478	4 131,011	8 903	20 292
6	47 8,845	47 262	24 27,522	12 816	10 387
4 94	2 504,185	9 352	2 683,661	7 447	2 359
22	9 100,291	8 1,026	5 127,819	4 1,307	17 309
5	48 8,262	18 580	55 1,834	48 129	54 52
19	10 81,758	7 1,044	13 50,593	20 638	37 182
8	42 11,790	57 135	20 32,478	37 372	8 413
2	59 1,718	59 54	56 1,610	55 51	43 146
11	39 13,142	42 289	40 8,468	45 186	53 86
7	55 5,623	52 181	40 15,683	27 504	11 369
11	35 16,023	36 355	32 21,770	29 482	40 173
5 85	8 238,607	6 553	5 260,255	8 603	4 240
19	14 55,439	30 430	9 74,662	24 579	34 193
28	3 296,467	2 1,772	22 28,874	46 173	18 297
4	20 34,115	15 595	39 17,692	40 309	4 453
3	58 2,089	58 62	52 3,035	50 89	44 145
12	36 15,415	38 334	18 39,348	9 854	3 463
4	28 22,467	17 584	10 70,473	1 1,831	13 329
17	26 24,094	44 278	17 41,117	31 477	5 436
13	31 19,805	31 427	21 29,954	19 645	35 185
8 100	8 469,891	8 777	4 305,155	5 504	8 277
6	37 15,046	22 526	19 36,026	5 1,259	7 423
16	33 18,600	20 561	27 25,819	14 780	37 182
6	53 7,185	54 154	44 10,063	43 216	1 622
8	46 9,870	48 248	38 17,779	33 447	28 236
16	19 34,646	3 1,305	31 22,411	10 844	29 234
13	45 10,442	56 148	50 5,012	51 71	52 88
3	57 5,276	53 174	57 1,150	57 38	58 24
8 68	9 101,065	8 360	9 118,260	8 422	5 228
12	23 27,843	16 586	11 66,119	3 1,392	16 316
31	8 109,120	10 882	3 195,167	2 1,577	24 254
14	15 44,672	6 1,058	33 20,215	30 479	27 241
23	7 119,338	11 791	7 100,613	18 667	22 285
13	21 31,923	28 450	43 12,105	47 171	45 121
16	12 57,730	9 919	35 19,759	39 315	55 49
5	50 8,189	32 426	.. .....	.. .....	.. .....
1 114	4 398,815	4 772	8 413,978	2 804	8 215

GEOGRAPHIC DISTRIBUTION OF LIBRARIES

The figures in italics and those prefixed to totals

COUNTY	Population in 1893	LIBRARIES			
		FREE		OTHER	
		No.	Volumes	No.	Volumes
Tompkins.....	44 33,612	6	13 27,186	3	5 187,937
Cortland.....	55 28,271	2	54 2,200	5	36 5,868
Chenango.....	40 37,602	6	44 5,982	4	31 7,047
Otsego.....	26 50,361	6	36 7,968	10	22 14,951
Broome.....	22 62,793	4	24 11,799	6	21 15,296
Tioga.....	52 29,675	6	25 10,693	...	.. ..
Chemung.....	30 47,223	2	58 1,098	7	25 12,048
S. cen. counties....	8 289,537	8 32	8 66,926	8 35	5 243,147
Schuyler.....	53 28,815	2	53 3,244	1	48 2,174
Yates.....	57 20,801	2	47 4,755	2	49 2,006
Steuben.....	14 82,468	9	11 27,876	8	24 12,199
Allegany.....	36 43,131	a 10	30 9,534	a 4	27 10,922
Livingston.....	41 37,010	3	46 5,108	4	32 7,012
Ontario.....	27 48,718	9	17 20,587	6	11 36,274
Wayne.....	28 48,259	5	42 6,823	5	41 4,031
Monroe.....	4 200,056	3	4 62,816	12	6 86,577
W. cen. counties....	6 509,258	4 43	5 140,743	6 42	7 161,195
Orleans.....	50 30,762	6	39 7,429	2	54 655
Genesee.....	45 33,436	6	19 16,632	3	43 8,764
Wyoming.....	48 31,218	9	18 17,051	1	55 651
Cattaraugus.....	23 61,774	5	43 6,097	12	16 22,135
Chautauqua.....	15 78,900	13	10 31,772	7	29 10,212
Erie.....	3 347,328	6	32 9,176	30	4 202,943
Niagara.....	19 64,378	5	22 13,322	6	26 11,315
West. counties.....	3 647,796	1 50	7 101,479	3 61	4 251,675
Totals.....	6,513,343	a 351	1,313,299	a 456	3,324,362

a Alfred univ. lib. with 10,223 volumes of which 1000 are free for circulation, is entered under both free and other libraries.

AND COMPARATIVE CIRCULATION BY COUNTIES (concluded)

show the rank of each county or section.

TOTAL			Volumes per 1000 population	CIRCULATION OF FREE LIBRARIES						
No.	Volumes			Total		Per 1000 population		Per 100 volumes		
9	4	215,123	1	6,400	16	44,550	6	1,028	41	164
7	52	8,068	43	285	48	6,484	42	229	19	295
10	40	13,029	37	346	54	1,842	56	49	57	31
16	27	22,919	27	455	25	26,245	26	521	13	329
10	24	27,095	29	432	14	48,349	16	771	9	410
6	44	10,693	34	361	30	23,324	13	786	30	218
9	38	13,146	44	278	58	1,070	58	21	49	97
9	67	310,073	2	1,071	8	151,864	4	524	6	227
3	56	5,418	51	188	47	6,973	41	242	31	215
4	54	6,761	40	325	45	8,622	34	414	39	181
17	17	40,075	23	486	12	51,634	21	626	35	185
13	29	20,456	25	474	29	23,601	25	547	25	248
7	41	12,120	39	327	41	14,631	35	395	21	286
15	13	56,861	4	1,167	37	19,213	35	395	50	93
10	43	10,854	50	225	49	6,159	49	128	51	90
15	6	149,393	12	746	6	123,650	23	618	32	197
6	84	301,938	5	593	6	254,433	6	500	9	181
8	51	8,084	46	263	42	14,565	32	473	33	196
9	30	20,396	14	610	26	26,043	15	779	42	158
10	34	17,702	19	567	36	19,615	22	625	48	115
17	22	28,232	26	457	34	19,896	38	322	15	326
20	16	41,984	21	532	8	77,154	7	978	26	243
36	5	212,119	13	611	28	24,478	52	70	23	267
11	25	24,637	33	383	15	47,505	17	738	12	357
2	111	353,154	7	545	7	229,256	9	354	7	226
806		4,647,661		713		3,933,623		604		300

Libraries of 10,000 volumes or more arranged in order of size

	Place	NAME OF LIBRARY	Control	Use	No. vo's.
1	New York...	N. Y. pub. lib. Astor, Lenox and Tilden foundations	End	R...	367,808
2	"	Mercantile lib.	Mem.	S...	253,783
3	Albany.....	N. Y. state lib.	Gov.	R. Fl	223,547
4	New York...	Columbia univ. lib.	Coll.	R. Fl	223,000
5	Ithaca.....	Cornell univ. lib.	Coll.	R. Fl	186,683
6	Brooklyn...	Brooklyn lib.	Mem.	S...	124,299
7	New York...	Gen. soc. mechanics and tradesmen lib.	Mem.	F...	106,440
8	"	New York society lib.	Mem.	R. S.	† 100,000
9	"	New York free circ. lib.	Mem. End	F...	90,446
10	Buffalo.....	Buffalo lib.	Mem.	R. S.	80,084
11	New York...	Union theo. sem. lib.	Coll.	R. Fl	70,000
12	Brooklyn...	Pratt inst. free lib.	Inst.	F...	60,023
13	"	Long Island hist. soc. lib.	Mem.	S...	57,042
14	New York...	Ass'n of the bar of the city of New York lib.	Mem.	Sl...	50,154
15	"	New York law inst. lib.	Inst.	S...	45,038
16	"	Maimonides free lib.	Mem.	F...	44,893
17	"	Y. M. C. A. lib.	Inst.	R...	† 43,666
18	Buffalo.....	Grosvenor pub. lib.	Pub.	R...	† 40,000
19	Syracuse.....	Syracuse univ. lib.	Coll.	R...	39,508
20	West Point...	U. S. mil. acad. lib.	Gov.	R. Fl	39,011
21	New York...	Aguilar free lib.	Mem.	F...	35,466
22	"	St John's coll. lib.	Coll.	Fl...	35,116
23	Clinton.....	Hamilton coll. lib.	Coll.	F...	34,762
24	Brooklyn...	Union for Christian work f. lib.	Inst.	F...	34,615
25	New York...	Cooper union lib.	Inst.	R...	33,794
26	Rochester...	Reynolds lib.	End.	F...	33,451
27	New York...	New York univ. lib.	Coll.	R...	32,958
28	Geneva.....	Hobart coll. lib.	Coll.	R. Sl	32,806
29	New York...	Amer. museum of nat. hist. lib.	Inst.	R...	31,064
30	Rochester...	Univ. of Rochester lib.	Coll.	R. Fl	30,763
31	New York...	Coll. of the city of New York lib.	Coll.	Fl...	72,271
32	Troy.....	Y. M. A. lib.	Inst.	F...	† 30,000
33	Schenectady.	Union coll. lib.	Coll.	Fl...	29,217
34	Rochester...	Central lib.	Pub. sch.	F...	29,000
35	"	Rochester theo. sem. lib.	Coll.	Fl...	28,659
36	New York...	Coll. of St Francis Xavier lib.	Coll.	Fl...	28,000
37	Syracuse.....	Syracuse central lib.	Pub.	F...	28,000
38	New York...	Gen. theo. sem. of P. E. church.	Coll.	R. Fl	26,367
39	"	New York hosp. lib.	Inst.	F...	† 26,000
40	Hamilton...	Colgate univ. lib.	Coll.	Fl...	24,757
41	New York...	Y. W. C. A. lib.	Inst.	R. Fl	24,407
42	Poughk'psie.	Vassar coll. lib.	Coll.	Fl...	24,132
43	Auburn.....	Theological sem. lib.	Coll.	F...	23,912
44	Newburgh...	Newburgh free lib.	Pub. sch.	F...	21,970
45	Utica.....	Utica pub. lib.	Pub. D.	F...	21,168
46	New York...	Cathedral lib.	Par.	F...	20,032
47	Poughk'psie.	Poughkeepsie lib.	Pub. sch.	F...	19,748
48	Buffalo.....	Canisius coll. lib.	Coll.	Fl...	† 19,500
49	New York...	Harlem lib.	Mem.	R. S.	19,367
50	Syracuse.....	Court of appeals lib.	Gov.	Fl...	19,200
51	Brooklyn...	Brooklyn law lib. 2d jud. dist..	Mem. Gov	Fl. S	18,960
52	Ithaca.....	Cornell lib. ass'n	End.	F...	18,697
53	Albany.....	Y. M. A. lib.	Inst.	R. S.	† 17,000
54	Rochester...	Court of appeals lib.	Gov.	R...	17,000

Libraries of 10,000 volumes or more, etc. (*concluded*)

	Place	NAME OF LIBRARY	Control	Use	No. vols.
55	New York...	Amer. geog. soc. lib.....	Mem.	R. S.	15,804
56	"	Equitable life assurance soc. lib.	Inst.	Fl...	14,896
57	"	Amer. inst. lib.....	Mem.	R. Fl	13,857
58	Gloversville	Gloversville free lib.....	Mem.Pub	F	13,670
59	Oswego	Oswego city lib.....	Pub.	R.	13,525
60	New York...	University club lib.....	Mem.	Fl...	12,866
61	Jamestown..	James Prendergast free lib.....	End.	F	12,567
62	Auburn	Seymour lib.....	Mem.End	F	12,350
63	Annandale..	St Stephen's coll. lib.....	Coll.	Fl	12,250
64	Sing Sing...	Mt Pleasant acad. lib.....	Sch.	Fl	12,000
65	Canton	Herring lib. St Lawrence univ.	Coll.	Fl	11,850
66	Batavia	Union sch. lib.....	Pub. sch.	F	11,572
67	Yonkers.....	Yonkers pub. lib.....	Pub. D..	F	11,033
68	Binghamton.	Supreme court lib.....	Gov.	R	10,792
69	Rome	Jervis lib. ass'n.....	End.	F	10,577
70	Alfred.....	Alfred univ. lib.....	Coll.	R	10,222
71	Hornellsville	Hornell free lib.....	End.	F	† 10,000
72	New York...	Masonic lib	Inst.	Fl	10,000
		Total.....	.....	.....	3,365,424

**Comparative growth of libraries adding 1000 volumes or more
arranged by size of addition**

	NAME OF LIBRARY	VOLUMES	
		Added	Total
1	New York, Columbia college lib.....	20,580	223,000
2	" " N. Y. public library.....	15,594	367,808
3	Albany, N. Y. state library.....	14,570	223,547
4	Ithaca, Cornell university library.....	13,578	186,683
5	New York, N. Y. free circulating library.....	11,201	90,446
6	" " Aguilar free library.....	6,978	35,466
7	" " N. Y. university library.....	6,769	32,958
8	" " Mercantile library.....	6,348	253,783
9	" " Gen. soc. of mech. & tradesmen.....	5,137	106,440
10	Long Island City public library.....	5,000	5,000
11	Brooklyn, Pratt institute free library.....	4,788	60,023
12	Buffalo library.....	4,378	80,084
13	Syracuse central library.....	4,370	28,000
14	Brooklyn library.....	4,233	124,290
15	New York, N. Y. society library.....	3,956	100,000
16	Schenectady free public library.....	3,905	3,905
17	New York, Ass'n of bar of city of N. Y.....	3,826	50,154
18	Herkimer free library.....	3,619	4,619
19	Brooklyn, Union for Christian work free lending lib...	3,581	34,615
20	Rochester, Central library.....	3,557	29,000
21	Utica public library.....	3,057	21,187
22	Brooklyn, Long Island hist. soc. lib.....	3,042	57,042
23	Jamestown, James Pranderkast lib. ass'n.....	2,523	12,567
24	Rochester, Reynolds library.....	2,514	33,451
25	New York, Cathedral library.....	2,438	20,032
26	Annandale, St Stephen's coll. lib.....	2,250	12,250
27	Cornwall-on Hudson, N. Y. mil. acad. lib.....	2,203	5,278
28	New York, Coll. of St Francis Xavier house lib.....	2,050	28,000
29	Round Lake institute library.....	2,025	2,025
30	Poughkeepsie, Vassar college library.....	1,984	24,132
31	New York, Amer. mus. of nat. hist. lib.....	1,833	31,064
32	" " N. Y. law institute lib.....	1,737	45,038
33	Syracuse university library.....	1,643	39,508
34	New York, Y. W. C. A. library.....	1,510	24,407
35	Newburgh free library.....	1,461	21,970
36	New York, Cooper union library.....	1,413	33,794
37	Geneva, Hobart college library.....	1,389	32,806
38	West Point, U. S. mil. acad. lib.....	1,386	39,011
39	New York, Mainmonides free lib.....	1,361	44,893
40	White Plains academy library.....	1,330	2,048
41	Rome, Jervis library ass'n.....	1,283	10,577
42	Fort Hamilton free library.....	1,278	3,401
43	Port Jervis free library.....	1,258	7,286
44	Ogdensburg public library.....	1,241	6,246
45	Auburn theological seminary lib.....	1,238	23,912
46	Gloversville free library.....	1,205	13,670
47	New York, Y. M. C. A. library.....	1,164	43,666
48	Haverstraw, King's daughters pub. lib.....	1,150	1,150
49	Buffalo, Canisius college lib.....	1,100	19,500
50	Brooklyn law lib. 2d jud. dist.....	1,067	18,950
51	Rochester, Univ. of Rochester lib.....	1,063	30,763
52	Littlefalls union school library.....	1,000	4,000
53	Southampton, Rogers memorial lib.....	1,000	1,000
54	Syracuse university coll. of med. lib.....	1,000	2,200
Total.....		201,169	2,756,654

Libraries of 1000 volumes or more, free to the public for lending, arranged in order of size

	Place	NAME OF LIBRARY	Control	VOLUMES		Circulation	Circulation per 100 vols.
				Added in 1 year	Total		
1	New York	Gen. soc. mech. & tradesmen lib.	New	5137	106,440	247,906	233
2	"	New York free circulating lib.	Mem. End.	11,201	90,446	686,504	759
3	Brooklyn	Pratt inst. free lib.	Inst.	4768	60,023	280,250	467
4	New York	Maimonides free lib.	Mem.	1361	44,893	94,828	211
5	"	Aguilar free lib.	Mem.	6978	35,466	296,809	837
6	Brooklyn	Hamilton college lib.	Coll.	895	34,762	3844	10
7	Brooklyn	Union for Christian work free lib.	Inst.	3384	34,615	177,892	15
8	Rochester	Reynolds lib.	End.	2514	33,451	19,021	57
9	Troy	Y. M. A. lib.	Inst.	.....	30,000	53,192	103
10	Rochester	Central lib.	Pub. sch.	3557	29,000	104,115	359
11	Syracuse	Syracuse central lib.	Pub.	4370	28,000	91,795	328
12	New York	New York hosp. lib.	Inst.	.....	26,000	.....	.....
13	Auburn	Theological seminary lib.	Coll.	1238	23,912	72,934	332
14	Newburgh	Newburgh free lib.	Pub. sch.	1461	21,970	118,167	558
15	Utica	Utica pub. lib.	Pub. D.	3057	21,187	69,130	345
16	New York	Cathedral lib.	Par.	2438	20,032	40,485	205
17	Poughkeepsie	Poughkeepsie lib.	Pub. sch.	785	19,748	34,088	182
18	Ithaca	Cornell lib. ass'n	End.	234	18,697	62,368	456
19	Gloversville	Gloversville free lib.	Mem. Pub.	1205	13,670	51,946	413
20	Jamestown	James Prendergast free lib.	End.	2523	12,567	16,001	130
21	Auburn	Strymour lib.	Mem. End.	380	12,350	21,563	186
22	Batavia	Union sch. lib.	Pub. sch.	778	11,572	47,211	428
23	Yonkers	Yonkers pub. lib.	Pub. D.	630	11,033	40,162	380
24	Rome	Jervis lib. ass'n	End.	1283	10,577	33,811	338
25	Hornellsville	Hornell free lib.	End.	496	10,000	47,282	475
26	Binghamton	City sch. lib.	Pub. sch.	987	9814	30,870	314
27	New York	Washington Heights free lib.	Mem.	459	.....	8968	97
28	Bath	Davenport free lib.	Pri. Mem.	100	9200	.....	.....

^a Rank of each library is given by figures in italics.

Libraries of 1000 volumes or more, free to the public, etc. (continued)

	Place	NAME OF LIBRARY	Control	VOLUMES		Circulation	α Circulation per 100 vols.
				Added in 1 year	Total		
29	Ilion	Ilion free pub. lib.	Pub.	210	7752	35,444	25
30	Glens Falls	Crandall free lib.	End.	299	7559	34,263	28
31	Johnstown	Union sch. lib.	Pub. sch.	373	7442	7263	134
32	Port Jervis	Port Jervis free lib.	Pub. D.	1258	7286	21,991	62
33	Middletown	Middletown pub. sch. lib.	Pub. sch.	108	7059	25,468	44
34	Attica	Stevens mem. lib.	Pri.	18	6854	10,365	113
35	Canandaigua	Wood lib. ass'n	Mem.	.....	6500	12400	158
36	Owego	Owego free acad. lib.	Pub. sch.	235	6135	17,150	78
37	Peekskill	Field lib.	End.	188	6307	122,200	47
38	Flushing	Flushing lib. ass'n	Mem.	302	6250	12,237	66
39	Ogdensburg	Ogdensburg pub. lib.	Pub.	1241	6246	14,812	83
40	Oswego	Oswego city sch. lib.	Pub. sch.	25	6174	9906	110
41	New York	Webster free lib.	Inst.	840	6026	26,561	30
42	Dryden	Southworth lib.	End.	207	5912	15000	140
43	Stapleton	Arthur Winter mem. lib. Staten Island acad.	Sch.	.....	5850	.....	.....
44	Lockport	Lockport pub. lib.	Pub. D.	333	5663	15,728	76
45	Mt Vernon	Mt Vernon pub. lib.	Pub. D.	469	5594	3378	140
46	Malone	Village sch. dist. lib.	Pub. sch.	180	5115	15,125	65
47	Hudson	High sch. lib.	Pub. sch.	.....	5050	.....	.....
48	Long Island City	Long Island City pub. lib.	Pub.	.....	5000	.....	.....
49	Port Henry	Sherman free lib.	End.	4	4945	7959	109
50	Geneva	Geneva class. & un. sch. lib.	Pub. sch.	489	4643	8287	102
51	Herkimer	Herkimer free lib.	End.	4619	4619	10,065	87
52	Oneonta	Oneonta pub. lib.	Pub. D.	259	4493	19,300	32
53	Rhinebeck	Starr inst. lib.	Mem.	148	4368	7140	103
54	Fredonia	Darwin R. Barker lib. ass'n	Mem.	450	4343	5094	128
55	Salem	Bancroft pub. lib.	End.	274	4274	6355	113
56	Littlefalls	Union sch. lib.	Pub. sch.	1000	4000	5100	125

57	Lowville	Lowville acad. lib.	Sch.	3969	750	171	19
58	Bay Ridge	Bay Ridge free lib.	Mem.	3943	12,949	54	328
59	Sing Sing	Sing Sing pub. lib.	Pub. D.	3927	14,158	44	301
60	Nyack	Nyack lib.	Mem.	3914	21,393	13	515
61	Schenectady	Schenectady free pub. lib. ass'n	Mem.	3905	17,692	23	463
62	Niagara Falls	Niagara Falls pub. lib.	Pub. D.	3888	18,510	21	476
63	Coloes	City lib.	Pub. sch.	3817	16,256	34	426
64	Cambridge	Union sch. lib.	Pub. sch.	3814	12,169	53	319
65	Cazenovia	Cazenovia pub. lib.	Mem.	3695	9026	32	242
66	Fort Hamilton	Fort Hamilton free lib.	Mem.	3401	8258	81	243
67	Warsaw	Union sch. circ. lib.	Pub. sch.	3350	96025	101	190
68	Jamestown	High sch. lib.	Pub. sch.	3304	9725	63	291
69	New Rochelle	New Rochelle pub. lib.	Pub. D.	3285	16,511	17	503
70	Canandaigua	Union sch. lib.	Pub. sch.	3203	.....	.....	.....
71	Amsterdam	Amsterdam lib. ass'n	Mem.	776	29,512	4	950
72	Edlytown	Starkey sem. lib.	Sch.	3109	14000	123	129
73	Albany	Albany free lib.	Mem.	3100	10,129	50	327
74	Palmyra	Class. union sch. lib.	Pub. sch.	3094	2503	141	84
75	Tarrytown	Tarrytown lyceum pub. lib.	Inst.	2965	6353	90	216
76	Dansville	Dansville pub. lib.	Pub. D.	2913	12,441	35	425
77	Albion	Albion pub. lib.	Pub. D.	2930	8089	73	281
78	New York	St Agnes free lib.	Mem.	2872	32,782	1	1171
79	Chatham	Union sch. lib.	Pub. sch.	2800	12,000	31	431
80	College Point	Conrad Poppenhausen ass'n lib.	Pub. sch.	2785	616	166	22
81	Boonville	Erwin lib. and inst.	Inst.	2743	7773	69	289
82	Yonkers	Women's inst. lib.	End.	2696	7685	60	289
83	New York	Olivet lib.	Inst.	2663	5935	86	226
84	Hornellville	Hornell free acad. lib.	Par.	2626	1500	171	19
85	Jamaica	Union sch. lib.	Pub. sch.	2600	.....	.....	.....
86	Stamford	Stamford sem. & un. sch. lib.	Pub. sch.	2521	8514	49	343
87	Lyons	Union sch. lib.	Pub. sch.	2484	1757	146	72
88	Oneida	Union sch. lib.	Pub. sch.	2453	7157	67	292
89	Tarrytown	Un. sch. lib. dist. no. 1 (Greenburg)	Pub. sch.	2453	3500	116	143
90	Watkins	Watkins pub. lib.	Pub. D.	2438	2517	129	103
91	Addison	Addison pub. lib.	Pub. D.	2412	6731	74	279
92	Westfield	Westfield acad. & un. sch. lib.	Pub. sch.	2350	1500	167	21
93	Saratoga Springs	Saratoga Springs pub. lib.	Pub. sch.	2337	27,125	2	1160
94	Catskill	Catskill pub. lib.	Pub. D.	2303	14,186	11	616

a Rank of each library is given by figures in italics.

Libraries of 1000 volumes or more, free to the public, etc. (continued)

	Place	NAME OF LIBRARY	Control	VOLUMES		Circulation	Circulation per 100 vols.
				Added in 1 year	Total		
29	Ilion	Ilion free pub. lib.	Pub.	210	7752	35,444	25
30	Glens Falls	Crandall free lib.	End.	299	7559	34,263	28
31	Johnstown	Union sch. lib.	Pub. sch.	373	7442	7263	134
32	Port Jervis	Port Jervis free lib.	Pub. D.	1258	7286	21,991	62
33	Middletown	Middletown pub. sch. lib.	Pub. sch.	168	7059	25,468	44
34	Attica	Stevens men. lib.	Pri.	18	6934	10,365	113
35	Canandaigua	Wood lib. ass'n	Mem.	.....	6500	12,400	158
36	Owego	Owego free acad. lib.	Pub. sch.	235	6136	17,150	78
37	Peekskill	Field lib.	End.	188	6307	122,200	47
38	Flushing	Flushing lib. ass'n	Mem.	302	6250	12,237	96
39	Ogdensburg	Ogdensburg pub. lib.	Pub.	1241	6246	14,812	83
40	Oswego	Oswego city sch. lib.	Pub. sch.	25	6174	9906	170
41	New York	Webster free lib.	Inst.	840	6026	26,561	30
42	Dryden	Southworth lib.	End.	207	5912	15,000	140
43	Stapleton	Arthur Winter mem. lib. Staten Island acad.	Sch.	.....	5850	.....	85
44	Lockport	Lockport pub. lib.	Pub. D.	383	5663	15,728	76
45	Mt Vernon	Mt Vernon pub. lib.	Pub. D.	469	5594	3378	149
46	Malone	Village sch. dist. lib.	Pub. sch.	180	5115	15,125	65
47	Hudson	High sch. lib.	Pub. sch.	.....	5050	.....	296
48	Long Island City	Long Island City pub. lib.	Pub.	15000	15000	.....	.....
49	Port Henry	Sherman free lib.	End.	4	4945	7959	161
50	Geneva	Geneva class. & un. sch. lib.	Pub. sch.	489	4613	8287	178
51	Herkimer	Herkimer free lib.	Pub. sch.	4619	4619	10,065	87
52	Oneonta	Oneonta pub. lib.	Pub. D.	259	4493	19,300	32
53	Rhinebeck	Starr inst. lib.	Inst.	148	4368	7140	163
54	Fredonia	Darwin R. Barker lib. ass'n	Mem.	450	4343	5094	128
55	Salem	Bancroft pub. lib.	End.	274	4274	6355	113
56	Littlefalls	Union sch. lib.	Pub. sch.	1000	4000	5100	125

57	Lowville	Lowville acad. lib.	Sch.	25	3969	750	171	19
58	Bay Ridge	Bay Ridge free lib.	Mem.	583	3943	12,949	54	828
59	Sing Sing	Sing Sing pub. lib.	Pub. D.	407	3927	14,158	44	361
60	Nyack	Nyack lib.	Mem.	542	3914	21,383	13	515
61	Schenectady	Schenectady free pub. lib. ass'n	Mem.	3905	3905	17,692	23	463
62	Niagara Falls	Niagara Falls pub. lib.	Pub. D.	885	3888	18,510	21	476
63	Collores	City lib.	Pub. sch.	.....	3817	16,256	34	426
64	Cambridge	Union sch. lib.	Pub. sch.	891	3814	12,169	53	319
65	Cazenovia	Cazenovia pub. lib.	Mem.	302	3695	9026	82	242
66	Fort Hamilton	Fort Hamilton free lib.	Mem.	1278	3401	8258	81	243
67	Warsaw	Union sch. circ. lib.	Pub. sch.	193	3350	96025	101	190
68	Jamestown	High sch. lib.	Pub. sch.	271	3304	9725	68	291
69	New Rochelle	New Rochelle pub. lib.	Pub. D.	571	3285	16,511	17	503
70	Canandaigua	Union sch. lib.	Pub. sch.	.....	3203	.....	.....	.....
71	Amsterdam	Amsterdam lib. ass'n	Mem.	776	3109	29,512	4	950
72	Eddytown	Starkey sen. lib.	Sch.	100	3100	14000	123	129
73	Albany	Albany free lib.	Mem.	386	3094	10,129	56	327
74	Palmyra	Class. union sch. lib.	Pub. sch.	460	2965	2503	141	84
75	Tarrytown	Tarrytown library pub. lib.	Inst.	279	2913	6353	90	216
76	Dausville	Dausville pub. lib.	Pub. D.	351	2930	12,441	35	426
77	Albion	Albion pub. lib.	Pub. D.	8	2872	8089	73	281
78	New York	St Agnes free lib.	Mem.	968	2800	32,782	1	1171
79	Chatham	Union sch. lib.	Pub. sch.	336	2785	12,000	31	431
80	College Point	Courad Poppenhuisen ass'n lib.	Inst.	72	2743	616	166	22
81	Boonville	Erwin lib. and inst.	End.	200	2696	7773	69	289
82	Yonkers	Women's inst. lib.	Inst.	377	2663	7685	69	289
83	New York	Olivet lib.	Par.	230	2626	5936	86	226
84	Hornellville	Hornell free acad. lib.	Pub. sch.	304	2600	7500	171	19
85	Jamaica	Union sch. lib.	Pub. sch.	.....	2521	.....	.....	.....
86	Stamford	Stamford sem. & un. sch. lib.	Pub. sch.	209	2484	8514	49	343
87	Lyons	Union sch. lib.	Pub. sch.	267	2453	1757	146	72
88	Oneida	Union sch. lib.	Pub. sch.	559	2453	7157	67	292
89	Tarrytown	Un. sch. lib. dist. no. 1 (Greenburg)	Pub. sch.	84	2453	3500	116	143
90	Watkins	Watkins pub. lib.	Pub. D.	123	2438	2517	129	103
91	Addison	Addison pub. lib.	Pub. D.	209	2412	6731	74	279
92	Westfield	Westfield acad. & un. sch. lib.	Pub. sch.	.....	2350	7500	167	21
93	Saratoga Springs	Saratoga Springs pub. lib.	Pub. sch.	149	2337	27,125	2	1160
94	Catskill	Catskill pub. lib.	Pub. D.	406	2303	14,186	11	616

a Rank of each library is given by figures in *italics*.

Libraries of 1000 volumes or more free to the public, etc. (continued)

	Place	NAME OF LIBRARY	Control	VOLUMES		Circulation	aCirculation per 100 vols.
				Added in 1 year	Total		
95	Delhi	Delaware acad. lib.	Sch.	12	2298	847	158
96	No. Tonawanda	North Tonawanda pub. lib.	Pub. D.	415	2270	8547	42
97	New York	Broome st. free lib.	Par.	42	2258	.....	377
98	East Aurora	Union sch. lib.	Pub. sch.	303	2237	11,001	19
99	Cold Spring	Haldane union sch. lib.	Pub. sch.	200	2200	1484	147
100	Irvington	Union sch. lib.	Pub. sch.	.....	2195	1080	153
101	Springville	Springville pub. lib.	Pub. D.	43	2180	8514	40
102	New York	De Witt mem. free lib.	Inst.	54	2159	8757	39
103	Belleville	Union acad. lib.	Sch.	.....	2150	450	167
104	Cattaraugus	Union sch. lib.	Sch.	215	2143	14,500	9
105	Waverly	High sch. lib.	Pub. sch.	313	2125	4957	84
106	Hoosick Falls	Union sch. lib.	Pub. sch.	106	2118	2496	127
107	Pine Plains	Pine Plains pub. lib.	Pub.	76	2104	.....	.....
108	Wellsville	Wellsville pub. lib.	Pub.	656	2082	6217	63
109	Round Lake	Round Lake inst. lib.	Sch.	2025	2025	.....	299
110	Le Roy	Le Roy lib. ass'n.	Mem.	40	2000	2000	131
111	Prattsburg	Franklin acad. & un. sch. lib.	Pub. sch.	89	1989	395	169
112	New York	Riverside free lib.	Inst.	866	1930	15,738	7
113	Wyoming	Middlebury acad. & un. sch. lib.	Pub. sch.	70	1900	300	174
114	Lansingburg	Union sch. lib. dist. no. 1	Pub. sch.	7	1894	1122	150
115	Fort Edward	Union sch. lib.	Pub. sch.	565	1865	5000	77
116	Franklin	Delaware lit. inst. lib.	Sch.	.....	1861	500	163
117	Silver Creek	Union sch. lib.	Pub. sch.	381	1857	2900	111
118	Waterville	Waterville pub. lib.	Pub. D.	672	1830	13450	98
119	Saugerties	Saugerties pub. lib.	Pub. D.	475	1799	8174	27
120	Attica	Union sch. lib.	Pub. sch.	.....	1754	.....	.....
121	Tonawanda	Tonawanda pub. lib.	Pub. D.	240	1750	2463	118
122	Randolph	Helen Culver lib. Chamberlain inst.	Sch.	.....	1740	1600	161
123	Puyettville	Union sch. lib.	Pub. sch.	.....	1612	705	155

124	Ellenville	Ellenville pub. lib.	Pub. D.	1857	17,148	3	1035
125	Penn Yan	Penn Yan pub. lib.	Pub. D.	1855	4622	74	279
126	Belmont	Belmont lit. & hist. soc. free lib.	Mem.	1826	4766	66	293
127	Mexico	Union sch. lib.	Pub. sch.	11800	400	164	25
128	Whitball	Union sch. lib.	Pub. sch.	11600	145	167	75
129	Angela	Angela lib. ass'n	Mem.	1584	2852	106	167
130	Rockville Center	Rockville Center pub. lib.	Pub. D.	1581	6450	38	408
131	Glen Cove	Glen Cove pub. lib.	Pub. D.	1572	2226	117	142
132	Elizabethtown	Elizabethtown lib. ass'n	Mem.	145	3051	97	195
133	Bronxville	Sch. lib. dist. no. 2	Pub. sch.	1560	1216	144	78
134	Clinton	Union sch. lib.	Pub. sch.	1557	18000	16	513
135	Bath Beach	New Utrecht free lib.	Mem.	1549	10,013	10	646
136	Naples	Union sch. lib.	Pub. sch.	1548	358	165	28
137	West Winfield	West Winfield free lib.	Pub. D.	1603	5592	43	372
138	Westport	Westport lib. ass'n	Mem.	1501	4307	71	287
139	Keseeville	Union sch. lib.	Pub. sch.	11500	1300	169	20
140	Poplar Ridge	Hazard lib.	End.	1500	1260	141	84
141	Shortsville	Myron M. Buck free lib.	Pri.	11500	6340	36	423
142	Sinclairville	Sinclairville free lib.	End.	1450	.....	.....	.....
143	Troy	Y. W. A. lib.	Inst.	1450	2987	93	206
144	Rondout	Dist. acad. lib.	Pub. sch.	1443	3131	38	217
145	Jamestown	Y. M. C. A. lib.	Inst.	1433	277	171	19
146	Sandy Hill	Union sch. lib.	Pub. sch.	1423	3048	91	214
147	Albany	Catholic union lib.	Inst.	1404	1121	144	80
148	Albany	Y. M. C. A. R. R. branch lib.	Inst.	1400	1368	134	98
149	Medina	High sch. lib.	Pub. sch.	1386	1870	120	134
150	Bainbridge	Union sch. lib.	Pub. sch.	1377	390	102	28
151	Kingston	Kingston free acad. lib.	Pub. sch.	1365	.....	.....	.....
152	Salamanca	Union sch. lib.	Pub. sch.	1363	4396	57	323
153	Bath-on-Hudson	No. Greenbush dist. no. 6 pub. lib.	Pub. D.	1350	6344	23	470
154	Hamburg	Union sch. lib.	Pub. sch.	1348	1200	139	89
155	Fonda	Union sch. lib.	Pub. sch.	1328	1600	126	120
156	Greene	Union sch. lib.	Pub. sch.	1309	1600	154	46
157	Canajoharie	Union sch. lib.	Pub. sch.	1301	1194	137	92
158	Sidney	Sidney pub. lib.	Pub. D.	1300	4320	52	332
159	Potsdam	Potsdam pub. lib. & reading room	Pub.	1287	543	155	42
160	Highland Falls	Morgan circ. lib.	Pub.	1282	3675	71	287
161	Jordan	Jordan free acad. lib.	Pub. sch.	1239	.....	.....	.....

a Rank of each library is given by figures in italics.

Libraries of 1000 volumes or more free to the public, etc. (concluded)

	Place	NAME OF LIBRARY	Control	VOLUMES		Circulation	a Circulation per 100 vols.
				Added in 1 year	Total		
162	Camden	Camden lib. ass'n	Mem	234	1220	10,978	5
163	Albion	Town lib.	Pub.	339	1217	3170	79
164	Chateaugay	Union sch. lib.	Pub. sch.	126	1216	1254	129
165	Elbridge	Munro coll. inst. lib.	Sch.	.....	1206	.....	.....
166	Carthage	High sch. lib.	Pub. sch.	.....	1200	12600	88
167	Homer	Homer acad. lib.	Pub. sch.	5	1200	4000	51
168	Huntington	Union sch. lib.	Pub. sch.	109	1190	.....	.....
169	Valatie	Union sch. lib.	Pub. sch.	.....	1169	.....	.....
170	Avon	Union sch. lib.	Pub. sch.	236	1165	1500	123
171	Haverstraw	King's daughters pub. lib.	Mem	1140	1150	3583	60
172	Lake Placid	Lake Placid pub. lib.	Pub. D.	61	1135	3393	63
173	Alexander	Union sch. lib.	Pub. sch.	.....	1133	410	160
174	Pocantico Hills	Pocantico Hills lyceum lib.	Mem	19	1130	1117	133
175	Salem	Washington acad. lib.	Sch.	.....	1130	.....	.....
176	Palatine Bridge	Union sch. lib.	Pub. sch.	9	1122	1018	138
177	Palisades	Palisades lib. & reading room	Mem	152	1122	1456	121
178	Liberty	Liberty pub. lib.	Pub. D.	79	1106	1610	115
179	Sherman	Union sch. lib.	Pub. sch.	103	1103	1868	105
180	Walden	Union sch. lib.	Pub. sch.	130	1100	1500	117
181	Gilbertsville	Gilbertsville free lib.	Mem	.....	1094	3400	61
182	Crown Point	Crown Point chapel lib.	Pub. D.	48	1077	2145	95
183	Fort Plain	Fort Plain free lib.	Mem	45	1070	5899	14
184	Perry	Union sch. lib.	Pub. sch.	150	1060	600	151
185	Maspeth	Union sch. lib.	Pub. sch.	55	1055	.....	.....
186	Argyle	Union sch. lib.	Pub. sch.	21	1041	1400	157
187	Stillwater	Union sch. lib.	Pub. sch.	60	1040	1788	104
188	Mayville	Union sch. lib.	Pub. sch.	90	1027	1590	112
189	Victor	Union sch. lib.	Pub. sch.	15	1027	.....	.....

190	Sherburne	Union sch. lib.	Pub. sch.	1022	.....	.....	.....
191	Mt Morris	Union sch. lib.	Pub. sch.	1013	690	147	68
192	Ilion	Ilion dist. lib.	Pub. D.	1010	5032	178	488
193	Alfred	Alfred univ. lib.	Coll.	1000	4857	20	485
194	Garrison	Garrison free reading room	Pri.	1000	.....	.....	.....
195	Holland Patent	Union sch. lib.	Pub. sch.	1000	.....	.....	.....
196	Marathon	Peck mem. lib.	End.	1000	2484	82	248
197	Morris	Union sch. lib.	Pub. sch.	1000	1000	137	100
198	Onondaga Valley	Onondaga free acad. lib.	Pub. sch.	1000	.....	.....	.....
199	Southampton	Rogers memorial lib.	End.	1000	1640	107	164
				1,222,138	3,775,787		309
				114,851			

^a Rank of each library is given by figures in italics.

**Libraries of 1000 volumes or more free for reference only,
arranged in order of size**

	-Place	NAME	Control	VOLUMES	
				Added	Total
1	New York.....	N. Y. pub. lib. Astor Lenox and Tilden foundations...	End	15,594	367,808
2	Albany.....	New York state lib.....	Gov.....	14,570	223,547
3	New York.....	Columbia univ. lib.....	Coll.....	20,580	223,000
4	Ithaca.....	Cornell univ. lib.....	Coll.....	13,578	186,683
5	New York.....	New York soc. lib.....	Mem.....	3956	100,000
6	Buffalo.....	Buffalo lib.....	Mem.....	4378	80,084
7	New York.....	Union theo. sem. lib.....	Coll.....	.....	70,000
8	New York.....	Y. M. C. A. lib.....	Inst.....	1166	43,666
9	Buffalo.....	Grosvenor pub. lib.....	Pub.....	882	† 40,000
10	Syracuse.....	Syracuse univ. lib.....	Coll.....	1643	39,508
11	West Point.....	U. S. military acad. lib.....	Gov.....	1386	39,011
12	New York.....	Cooper union sch.....	Inst.....	1413	33,794
13	New York.....	N. Y. university lib.....	Coll.....	6769	32,958
14	Geneva.....	Hobart coll. lib.....	Coll.....	1389	32,806
15	New York.....	Amer. museum of nat. hist. soc. lib.....	Inst.....	1833	31,064
16	Rochester.....	Univ. of Rochester lib.....	Coll.....	1063	30,763
17	New York.....	Gen. theo. sem. of the P. E. church lib.....	Coll.....	.....	26,367
18	New York.....	Y. W. C. A. lib.....	Inst.....	1510	24,407
19	New York.....	Harlem lib.....	Mem.....	924	19,367
20	Albany.....	Y. M. A. lib.....	Inst.....	450	† 17,000
21	Rochester.....	Court of appeals lib.....	Gov.....	506	17,000
22	New York.....	Amer. geog. soc. lib.....	Mem.....	502	15,804
23	New York.....	Amer. inst. lib.....	Mem.....	39	13,857
24	Oswego.....	Oswego city lib.....	Pub.....	175	13,525
25	Binghamton.....	Supreme court lib.....	Gov.....	175	10,792
26	Alfred.....	Alfred univ. lib.....	Coll.....	659	10,222
27	Buffalo.....	Buffalo hist. soc. lib.....	Mem.....	323	9144
28	New York.....	Bryson lib. Teachers coll.....	Coll.....	958	7569
29	Brooklyn.....	Med. soc. of Kings co. lib.....	Inst.....	502	7500
30	Corning.....	Corning lib. ass'n.....	Mem.....	† 50	7000
31	New York.....	Bd of foreign missions of the pres. church lib.....	Inst.....	734	7000
32	Buffalo.....	Y. M. C. A. lib.....	Inst.....	421	6776
33	Buffalo.....	Buffalo cath. inst. lib.....	Inst.....	422	6718
34	Utica.....	Oneida hist. soc. lib.....	Mem.....	64	6450
35	Wap'ger's Falls	Grinnell lib. ass'n.....	Mem. End	140	5780
36	Buffalo.....	Un. of Buffalo med. dep't lib.....	Coll.....	510	5535
37	Oswego.....	State normal school lib.....	Sch.....	604	5510
38	Lima.....	Genesee Wesleyan sem. lib.....	Sch.....	790	5290
39	New York.....	Amer. soc. of civil eng. lib.....	Mem.....	214	5105
40	Glens Falls.....	Glens Falls acad. lib.....	Sch.....	164	5059
41	New York.....	Coll. of phar. of the city of New York lib.....	Coll.....	26	4649
42	Olean.....	Forman lib.....	Mem.....	46	4580
43	Albany.....	Y. M. C. A. lib.....	Inst.....	620	4396
44	Saratoga Sp'gs.	4th jud. dist. law lib.....	Gov.....	† 200	† 3800
45	Moravia.....	Powers lib. ass'n.....	Mem.....	9	3627
46	Buffalo.....	Buffalo soc. of nat. sci. lib.....	Inst.....	127	3581
47	Fort Plain.....	Clinton liberal inst. lib.....	Sch.....	56	3564
48	Huntington.....	Huntington pub. lib.....	Mem.....	108	3537

Libraries of 1000 volumes or more free for reference, etc. (continued)

	Place	NAME	Control	VOLUMES	
				Added	Total
49	New York.....	Mechanical engineers lib....	Mem.....	185	3200
50	New York.....	Mott mem. med. and surg. lib.	Mem.....	.....	3000
51	Rome.....	Y. M. C. A. lib.....	Inst.....	† 136	3000
52	Seneca Falls...	Seneca Falls lib. ass'n.....	Mem.....	132	2813
53	New York.....	University settlem't free lib	Inst.....	425	2649
54	Rochester.....	Rochester free acad. lib.....	Pub. sch.....	.....	2340
55	Montour Falls.	Cook acad. lib.....	Sch.....	17	2174
56	New York.....	Five Points mission lib.....	Inst.....	.....	2100
57	Deposit.....	Union sch. lib.....	Pub. sch.	344	1913
58	Carmel.....	Literary union lib.....	Mem.....	22	1742
59	Buffalo.....	N. Buff. cath. ass'n and lib..	Mem.....	67	1628
60	New York.....	Health dep't lib.....	Gov.....	50	1551
61	Albany.....	Y. W. C. A. lib.....	Inst.....	171	1512
62	Gouverneur...	Reading room ass'n.....	Mem.....	74	1392
63	Nyack.....	Union sch. lib.....	Pub. sch.....	.....	1327
64	Chester.....	Union sch. lib.....	Pub. sch.....	.....	1315
65	Hudson.....	Y. M. C. A. lib.....	Inst.....	100	1300
66	Newark.....	Union sch. lib.....	Pub. sch.....	.....	1150
67	Watertown...	Y. M. C. A. lib.....	Inst.....	.....	1130
68	Ballston Spa...	Saratoga co. law lib.....	Gov.....	50	1100
69	Warrensburg..	Union sch. lib.....	Pub. sch.....	10	† 1060
70	Gouverneur...	High sch. lib.....	Pub. sch.....	244	1043
		Total.....	.....	104,255	1,905,642

College libraries

	Place	NAME	VOLUMES	
			Added	Total
1	New York....	Columbia university library	20,580	223,000
2	Ithaca	Cornell university library	13,578	186,683
3	New York....	Union theological seminary library.....	.....	70,000
4	Syracuse	Syracuse university library	1643	39,508
5	New York....	College of St Francis Xavier library....	2570	35,800
6	" "	St John's college library	466	35,116
7	Clinton	Hamilton college library	895	34,762
8	New York....	New York university library	6769	32,958
9	Geneva	Hobart college library	1389	32,806
10	Rochester	University of Rochester library	1063	30,763
11	New York....	College of the city of New York library..	929	30,271
12	Schenectady..	Union college library	230	29,217
13	Rochester	Rochester theological seminary library..	625	28,659
14	New York....	Gen. theo. sem. of P. E. church library..	.....	26,367
15	Hamilton	Colgate university library	938	24,757
16	Poughkeepsie	Vassar college library	1984	24,132
17	Auburn	Theological seminary library	1238	23,912
18	Buffalo	Canisius college library	1190	19,500
19	Brooklyn....	Brooklyn college of pharmacy library...	1067	18,950
20	Annandale ...	St Stephen's college library	2250	12,250
21	Canton	Herring library, St Lawrence university..	.....	11,850
22	Alfred	Alfred university library	159	10,222
23	New York....	Manhattan college library	330	8485
24	" "	Bryson library, Teachers college	958	7569
25	Allegany	St Bonaventure's college library	16	7329
26	Niagara Univ.	Niagara university library	300	7300
27	Brooklyn....	Polytechnic inst., Spicer mem. library..	122	7222
28	"	St John's college library .....	.....	7200
29	Troy	Rensselaer polytechnic inst. library	132	6000
30	Aurora	Wells college library .....	.....	5614
31	Buffalo	University of Buffalo med. dep't library..	510	5535
32	New York....	Coll. of pharmacy of city of New York lib.	26	4649
33	Brooklyn....	St Francis college library	40	4100
34	Carmel	Drew sem. and fem. coll. library .....	.....	† 3000
35	HartwickSem.	Hartwick seminary theo. dep't library..	.....	3000
36	Syracuse	Syracuse univ. coll. of med. library	1000	† 2200
37	New York....	Eclectic medical college library .....	.....	2156
38	Buffalo	German Martin Luther theo. sem. library	6	† 1523
39	Albany	Albany law school library	44	1426
40	Niagara Univ.	Seminary of Our Lady of Angels library..	40	1000
41	New York....	Med. coll. and hosp. for women library..	.....	908
42	" "	Women's med. coll. of the N. Y. infirm. lib.	49	825
43	" "	Barnard college library .....	.....	700
44	Rochester	Wagner mem. Lutheran college library..	15	700
45	Buffalo	Niagara univ. med. dep't library .....	.....	665
46	New York....	Post grad. med. sch. and hosp. library..	25	† 600
47	" "	College of vet. surgeons library .....	.....	500
48	" "	American veterinary college library .....	.....	400
49	Buffalo	Buffalo college of pharmacy library	12	122
50	Albany	Albany college of pharmacy library ....	.....	92
Total			63,188	1,072,303

Law libraries arranged in order of size

	Place	NAME	Control	VOLUMES	
				Added	Total
1	Albany.....	N. Y. state law lib.....	Gov.	1961	55,545
2	New York.....	Ass'n of bar of city of N.Y. lib.	Mem.....	3826	50,154
3	New York.....	N. Y. law inst. lib.....	Inst.....	1737	45,038
4	Ithaca.....	Cornell univ. law lib.....	Coll.....	688	24,270
5	Syracuse.....	Court of appeals lib.....	Gov.....	525	19,200
6	Brooklyn.....	Brooklyn law lib. 2d jud. dist.	{ Mem. } { Gov.. }	1067	18,950
7	Rochester.....	Court of appeals lib.....	Gov.....	506	17,000
8	New York.....	Equitable life assur. soc. lib.	Inst.....	530	14,896
9	Hinghamton.....	Supreme court lib.....	Gov.....	175	10,792
10	Newburgh.....	2d jud. dist. law lib.....	Gov.....	795	4879
11	Saratoga Sp'gs	4th jud. dist. law lib.....	Gov.....	7200	73800
12	New York.....	N. Y. law sch. lib.....	Sch.....	114	1733
13	Albany.....	Albany law sch. lib.....	Sch.....	44	1426
14	Ballston Spa...	Saratoga co. law lib.....	Gov.....	50	1100
		Total	12,218	268,783

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REPORT OF STUDY CLUB DIVISION, 1896

To the regents of the University of the State of New York

I have the honor to report as follows for the year ending September 30, 1896.

As the privileges offered by this department become more generally known, the number of study clubs willing to agree to consecutive study during a specified time continues to increase. 122 clubs are now registered on the University lists, 58 of which were added during the past year, an increase of nearly 100 per cent. The reading circles increase but slowly because the traveling library usually soon changes a reading circle into a study club, the members preferring to consult the books according to their own preferences rather than to follow a fixed course of reading in common with others. With the aid of books and pictures, the study club becomes in the widest sense the school of the people. Through this comradeship in study history, for example, is no longer a 'dry story of a succession of tyrants' but becomes a record of the gradual advancement of civilization and of the increase of culture with the ends that these have subserved in each nation.

Study club work is engaged in for various purposes and it accomplishes varied and complex results. It attracts young persons who have been unable to leave home or business to attend college, those of maturer years who wish to supplement the meager training of youth and also men and women of excellent mental habits and education, who feel the need of some regular

appointment for study and research which will keep alive energy of thought and prevent their minds from lapsing into an inertia from which extrication is usually so difficult. This class of members is of course of the greatest assistance in the literary life of the club, and while often not as much in earnest as others with less literary training, they usually keep the club work on a broader and more progressive basis. The democratic element of club work is of great value not only socially but intellectually. one member of greater training and ability helping without offense his less fortunate neighbor.

Educational results depend largely on the literary leaders of the club, whatever the title may be. In some clubs the president has the entire charge of the literary work; in others, and preferably, a program committee attends to it. This committee can give entire attention to the matter undisturbed by administrative details, and appointments can be made privately after careful consideration. At least one member of the committee, preferably the chairman, should have served on it before. This will usually prevent the too frequent mistake of novices by which the program for each meeting is made to include so much that anything but a cursory and inadequate treatment of each topic would bring on serious mental indigestion. Care should be taken also, to make one topic or phase the center of each program, about which all the other papers and talks are grouped so that at the end of each meeting one thought at least will be brought home to each member, the number of accessory thoughts gained depending on the mental equipment and alertness of individuals.

The roll call can be made of distinct educational value by requiring some brief literary response instead of the conventional 'Here.' The memory is strengthened and a fund of valuable short quotations is acquired if each member recites a short passage of poetry or prose when his name is called; the power of condensation or summarizing can be increased by requiring brief synopses of some matter of general interest chosen from current events, or of some topic or incident connected with the subject of study; quickness of thought may be developed by assigning a general

topic and allowing each one at roll call to ask a question of another member requiring a brief answer. It is highly desirable and almost essential to the acquirement of mental power that every member should be required to take at least some minor part in every meeting. In science clubs unable to provide apparatus for frequent experiments, attention should be given to its construction, as this not only adds to the resources of the club but increases interest in the experimental study of the subject.

A competent critic can render much practical service by noting errors that should be corrected. In addition to calling attention to the meaning and pronunciation of words, he should explain historical or other allusions not clear to all members, aid their memories by references to points brought out in previous study and put definitely before all the pivotal thought of each meeting.

In clubs willing to engage in actual work, various devices may well be employed to continue study without wearying the members. Frequent reviews under various disguises should be given. Question boxes to which any one may contribute afford opportunity for interesting all and at the same time bringing out through well devised questions, the important topics of previous meetings. Open conversation and discussion are simpler forms of bringing about the same ends. Sometimes a competitive question exercise can be used to advantage.

In certain organizations including a number of members of forensic tastes, the debate plan is often most successful. The leaders appointed should have in mind, not only the decision of the point under debate, but the relation of the specific question to the whole subject of study. So far as possible every member should be called on for an expression of opinion during the progress of the debate to prevent its becoming simply an interesting spectacle during which the greater part of the club makes little mental effort.

The problem of study club management requires constant activity, tact and judgment on the part of the managers and leaders. Club members must be made to feel their obligations

both to themselves and to the club but when this has been accomplished the methods of fulfilling the obligations must be carefully considered by those who have the work in charge. Under proper guidance study clubs can be made one of the greatest centers of thought and literary life in every community.

In submitting the second report of the study club division, it is gratifying to see that consecutive study grows in favor wherever it has been adopted and wisely managed. Applications for libraries on this basis increase in number though lack of funds made it impossible to send out new libraries after May of the present year. The report from each club is given in tabular form and in addition a few selected reports of a more general character have been printed to supply more specific information. These general reports are arranged in order of registration, the majority being from the clubs registered during the year just past.

REGISTERED STUDY CLUBS

HIGHLAND PARK LITERARY CLUB, BUFFALO

During the year 1895-96 the club continued its study of art and at the close of the year's work an examination was given by the University. One of the credentials given to the candidates was with honor.

UNIVERSITY EXTENSION STUDY CLUB, OGDENSBURG

In reviewing the second year's work of our club, it is pleasing to note the regular attendance and continued interest of its members. The study of England, begun in a general way, proved so instructive that not only were the British isles the subject of our second program but the same general subject has been followed in preparing the syllabus for the coming season, on the growth of the British empire, including the history and politics of England's dependencies. The literary work for the season of 1895-96 consisted of 18 papers on England, one on the Isle of Man, two on Wales, three on Scotland and four on Ireland. Special papers were written on English architecture, the Art galleries of London, and the literary and artistic associations of

Old Chelsea. These papers generally occupy an hour, and are the result of many months' careful study on the part of the compiler.

To add to the interest of the subjects, maps and pictures are shown, and charming personal reminiscences and sketches are informally furnished. A diversion from the literary work was a delightful club tea given by one of its members, and the season was pleasantly terminated by an excursion up the St Lawrence river.—HARRIET FRANK, *Secretary*

SATURDAY CLUB, SCHUYLerville

The winter of 1895-96 was one of growth and enterprise for the Saturday club of Schuylerville. In addition to careful work on the prescribed course, English authors of the 19th century, the club took up a close analytic study of Shakspeare's tragedies, assigning the characters a week in advance. Special attention was given to the study of dramatic expression, and several plays were presented during the winter for charitable purposes.

A special study of some of George Eliot's and Charles Kingsley's works was made by assigning five chapters of each book selected to different members of the club. These were then related in order as a test of memory at the following meeting. The books of the traveling library were found particularly valuable in following out the prescribed course of study. The club has more than doubled its membership and is characterized by enthusiastic cooperation in all it undertakes.—ELOISE C. CARPENTER, *Secretary*

EVERY SATURDAY NIGHT CLUB, WATERVILLE

This club meets each Saturday from the first of October to the last of May at the homes of the members and attendance is full and prompt. The historical studies consist to a great degree of selections; maps, charts and photographs are introduced although poems and articles of a more imaginative character are often read. The historical study is intended as a review for the club members who are generally more interested in the social, ethical, philosophical and esthetic aspects of the subjects than the historical and political outlines. The situations and characters pre-

sented are freely and informally discussed. Several members have spent some time in Italy and their reminiscences are always interesting and together with photographs and souvenirs are a valuable aid.—MRS CORDELIA B. PECK, *Secretary*

FORTNIGHTLY CLUB, POTSDAM

A new constitution was adopted by the club April 20, 1895, according to which any resident of Potsdam over 18 years of age is eligible to membership. The average attendance at the meetings which are held biweekly from September to June is 31.

In addition to the course of study on Italian history, literature and art, a course of five lectures on recent English and American poetry with illustrative readings was given by Prof. Clinton Scollard of Hamilton college. The admission fee was placed as low as possible, the idea being merely to pay expenses and give all an opportunity to hear the lectures; the result however was a financial success for the club.

A course of lectures was also given by active and honorary members in the assembly room of the normal school and complimentary tickets issued for the course. The subjects were Venice with stereopticon views by Dr T. B. Stowell, Technique of culture by Prof. Stansbury Norse, Florence with stereopticon views by Dr T. B. Stowell, Educational acts and influence of Napoleon by Prof. C. F. Simson. The course closed with a literary and musical entertainment.

UNITY CLUB, ALBANY

The work for the year was divided into three sections, critical Bible study, sociology and literature. The Bible section had a membership of 23 and held weekly meetings for the study of the synoptic gospels. A lecture was given at each meeting by the leader, Rev. W. M. Brundage and this was followed by discussion.

The sociology and literature sections held biweekly meetings. The sociologic questions discussed were municipal government, suffrage, intemperance, taxation, initiative and referendum, money and socialism. The attendance at the municipal reform

meeting was 200. The work in literature consisted of papers and discussions on the New England authors, with readings and quotations from their works. A lecture on Emerson was given by the Rev. Mr Slicer of Buffalo.

CIVIC LEAGUE OF THE WOMAN'S INSTITUTE, YONKERS

The league is decidedly educational in character though meetings are held irregularly and there is no settled program. 17 meetings were held in 1896 and a course of 10 lectures on Constitutional history was given by Miss Jane M. Slocum. There were also several addresses by the president on various subjects demanding activity on the part of the league followed by discussions, and three papers by the secretary on the Consumers league. Causes of failure in section work in the Civic league and advice for its remedy, and Municipal reform in Glasgow. A report with statistics was presented by the tenement house inspector and an account of street cleaning in Hamburgh was given by one of the members.—MRS S. R. SHARMAN, *Secretary*

FORTNIGHTLY CULTURE CLUB, MEDINA

The work of the club has been done under the direction of the Boston society to encourage studies at home. The subject for the year included five American authors, Cooper, Parkman, Whittier, Hawthorne and Holmes and two meetings on contemporary women writers. The main topic for the evening is usually presented in a written paper of some length. The minor topics, two or three in number, are written or given as informal talks. They are book reviews or discussions of some feature of the writer's work. A general discussion by the club follows each topic. Current events are presented at each meeting and occasionally music is introduced. Examination questions covering the work of each author, prepared by the Society to encourage studies at home, are read by the president and answered by the members of the club.

The members are not held to a definite line of reading or study but are expected to prepare with some care the topics assigned them and to inform themselves as far as possible on the other topics. During the past year it was decided to have the main

papers and some of the minor topics type written on paper of uniform size, bound in a neat cover and kept as the property of the club.

EMERSON CLUB, MT VERNON

The first year of the Emerson club was most successful. The membership numbered 30 and meetings were held at the universalist church twice a month with an average attendance of 14. The program included the reading of one of Emerson's poems, the essay of the evening, a paper on some portion of Emerson's life or work and an informal reading and discussion of one of his essays. A comparative study of Emerson, Hawthorne and Thoreau is planned for next year.

SHAKSPERE CLUB, FREDONIA

The Elizabethan dramatists was the subject of study for 1895-96. The club was organized in 1885 and studied Shakspeare's plays till 1894 when the history of dramatic art was begun. The plays were read in chronologic order and the members are agreed that for their club, at least, this method is the true one. After interesting discussion it was also decided that dramatic art history can be better appreciated after a systematic study of specific dramas, rereading the plays if necessary, as illustrations, in connection with the historical treatment of the subject.

NEW CENTURY CLUB, UTICA

In addition to its literary work, the club maintains a kitchen garden for poor children throughout almost the entire year, about 10 members of the club devoting themselves to this work. 80 children were taught the past year. The school meets once a week and includes cooking and sewing schools. Weekly classes in civil government and physical culture, a Chautauqua class and a housekeeper's class were also maintained this year. The class in civil government used as a text-book Fiske's *Civil government in the United States* and did much collateral reading. The interest of the classes, averaging 20 members each, was so great that the meetings were continued throughout the summer.—MARY A. MITCHELL, *Secretary*

LITERARY CLUB OF THE CHURCH OF THE MESSIAH, BUFFALO

The subject of study for the year was the History of Egypt, four meetings being devoted to the ancient empire, one to the middle empire, five to the new empire and six to Egypt under foreign nations. After the reading of the minutes the subjects for the afternoon are presented in an essay or address, the time for each being limited by the committee arranging the work. 30 papers were read during the past year. The work was made more interesting by the loan of valuable views and curios and the aid of members who had traveled in Egypt. Papers are followed each week by the report of a committee on archeology, whose duty is to keep the club informed of all discoveries important to the period under consideration.

JUDEAN CLUB, ROCHESTER

Though the Judean club met with opposition at first, the membership gradually increased to 50. The library numbers over 35 volumes and it is planned to use the surplus in the treasury to purchase more books. The systematic course of lectures attempted on Jewish history were not so successful as was hoped for owing to the fact that the members were busy endeavoring to increase the membership and arouse enthusiasm in the club. Several debates on questions pertaining to the Jewish sect have been given in which only members participated. New methods will be introduced into the work next year.—LOUIS LIPSKY, *Secretary*

SILVER CREEK STUDY CLUB

The Silver Creek study club has no constitution and the meetings are very informal. The officers are president and secretary. Weekly meetings are held from September to April. The course for the year was on Colonial history and government, the articles of confederation and the constitution. The president calls on members to discuss topics on the program, allowing the utmost liberty in the expression of views. The discussions are usually very animated.

SHAKESPEARE SOCIETY, FULTON

The Fulton Shakespeare society was organized in 1889. Bi-weekly meetings are held from October to April and usually three of Shakspeare's plays are studied each year. The first hour of the meeting is devoted to reading the act which is under consideration, studying the text carefully. The last hour and a half is given to the discussion of questions assigned at the previous meeting. These questions have been secured from the Poet-lore company, from one of the professors in Worcester technical institute, from Cornell university, from Shakspeare clubs and from members of the local society. The plays studied this year were *Macbeth*, *Richard 2* and preparatory work on *Henry 6*.

DAS KRAENZCHEN, BUFFALO

Das Kränzchen is a study club of 16 members which was originally organized in a high school class for the study of German, in 1890. It has no formal constitution. Biweekly meetings are held from October to June consisting of discussions, recitations and occasionally formal papers. During 1895-96 the club studied sculpture using Farrar's *Art topics* and it is planned to take up the study of Italian painting next year.

SHAKESPEARE CLUB, CARTHAGE

The club meets once a week from October to April and has studied during the past year *King John*, *Winter's tale* and *King Lear*. Roll call is responded to with a quotation from the day's lesson. The club has also been learning long quotations selected from plays already studied. These are repeated in concert before the study of the day's lesson. Then follows the reading of the play with papers and discussions.

POST PARLIAMENT, NEW YORK

The Post parliament is so called because organized to continue practice after parliamentary courses with Mrs E. H. Walworth or others. Mrs Walworth, the founder of the club, is the first president and is elected for life. The club now numbers 125, all members of Mrs Walworth's classes or of any class under supervision of the association, being eligible to membership.

The officers consist of three or more vice-presidents, a recording and a corresponding secretary with assistants if needed, a treasurer and a librarian elected at the annual meeting. These officers with three members also elected at the annual meeting form an executive committee which administers the affairs of the association as directed by the general meetings.

Standing committees on current events, current literature, instruction, printing and press, library and auditing are appointed by the president. The committees on events and literature arrange the subjects for debate or discussion and appoint the members who are to take part. The executive committee prepares the rules for debate. A time keeper is chosen for each meeting following in alphabetic order. The committee on instruction keeps a record of classes and attends to their interests.

The objects of the club as stated by the constitution are the practice and study of parliamentary law by its members and the promotion of the study of parliamentary law by means of classes conducted under its supervision or encouragement; the observation and study of the legislative and executive functions of government and private associations; and the gradual collection and holding of a library of books, pamphlets, etc. bearing on these subjects. A moot parliament is held once in each session to illustrate particular phases of legislation.

PROGRESSIVE CLUB, HERKIMER

The Progressive club was organized in January 1895, with a membership limited to 30, which was later increased to 35. Bi-weekly meetings were held at the homes of the members till November 1895 when the club was given a room in the new library building. There is an annual fee of \$1 which is sufficient for the general expenses of the club. During 1895 the club joined the State and General federation of women's clubs and sent a delegate to the convention at Louisville, Ky. Friendly relations are established with the Herkimer county historical society, a club of men, and the trustees of the free library have agreed to buy books needed for club work

A very profitable year was spent in the study of the history, art and literature of France, each member preparing and reading two papers during the year. The traveling library was found to be of the greatest assistance. This year is to be devoted to the study of Egypt and current topics, with special days given to art, music, education and domestic economics.—ELIZABETH BACON MAY, *Secretary*

**ALPHA BRANCH OF THE UNIVERSITY EXTENSION STUDY CLUB,
OGDENSBURG**

The success of the University extension study club of Ogdensburg and the fact that its membership is limited led to the formation of a second club called the Alpha branch, consisting of 20 young ladies, meeting twice a month from September to June for the study of English history. The meeting is called to order at seven o'clock and the first half hour is devoted to current topics. Each member is expected to have some knowledge, however slight or indefinite, of the subject of the evening's work. A report is given by each one at roll call in regard to this preparation, including the books used. From 7:35 to 7:50 the questions assigned at the previous meeting are answered. This constitutes the discussion and is considered an important feature of the work. From 7:50 to 8:45 is devoted to the paper and any readings, recitations or papers which the writer of the paper for the evening may have assigned. By this method one person is made the leader of the main work of the evening, though each evening's work is carefully laid out in the annual program. From 8:45 to 9 questions are given out by the leader of the next meeting. These questions are intended to cover the program for the evening thus leaving the writer of the paper free to exercise her literary talent on any portion of the program she may choose.—Mrs O. W. DODGE, *Librarian*

PLEASANT HOUR CLUB, CUBA

The Pleasant hour club has an active membership of 15, 10 women and five men, and six honorary members. 29 meetings were held during the year devoted to the study of Spanish history and literature and 44 papers were read. The roll call is re-

sponded to by giving some fact in connection with Spain's history or condition, a Spanish legend or a quotation from some Spanish author.

The critic's report serves as a partial review of the previous meeting.

MONDAY SHAKSPERE CLUB, NYACK

This club was organized in 1888 as a Shakspeare club and so remained for several years when it was decided to take up a different line of work at alternate meetings. The first reading was on Early civilization and continued two years. The second choice of the club was Homer, the *Iliad* being read for one year and the *Odyssey* during the following year. The past year was devoted to the study of Dante. The text is read carefully at home and all references looked up; doubtful matters are discussed during the class reading which occupies one hour and a half.

MONDAY CLUB OF FIRST PRESBYTERIAN CHURCH, ATTICA

The present year's course has been on *Julius Cuesar* and *King Lear* including 19 meetings. 64 members are enrolled and the average attendance has been 46. A traveling library of 100 volumes on Shakspeare has been in use. Mrs J. K. Curtis' syllabus has been used and five lectures have been given by Prof. J. H. Gilmore on Shakspeare and his plays.

PROSPECT AV. BAPTIST CHURCH LITERARY SOCIETY, BUFFALO

The Literary society looks back on 1895-96 as a live year of work. The subject, Europe of to-day, because of its present day nature inspired rapid, concise, comprehensive thinking. Magazines and papers were eagerly read that some item might be culled for a Monday evening. This brings us to the pleasant duty of extending to Europe the society's heartfelt gratitude for presenting this winter such a variety of good acting: be it comedy, drama or tragedy the scene has been quickly shifted from quiet little Belgium to despotic Russia, or thundering Turkey; the play has been well costumed from the quaint Swiss peasant to the ermine of England's court. The stage settings have been unexceptionable; at one time, the immaculate Holland home with its blue and white tiles and again, that scene where

the glaciers of Norway formed a background and the midnight sun turned night into day; where the band of footsore, sick, disconsolate women, men and children tramped to worse than death in Siberia. How interesting also the questions of state; the Iron chancellor and Germany's emperor becoming friends; the ups and downs of gold from England's vaults to Spain's hoard, now fast diminishing! Then, when the theater became an art gallery, we reveled in the colorings, in the eye-stories; again and again returning to Italy for comparison, living over our 'Four centuries of art.'

The members have gained much individually from the fact that talks have been the order of the day, while each country has been studied in its relative position on the progressive map. Two evenings have been devoted to England, Germany, France respectively, and Russia and Turkey furnished programs for the open club nights.

The president opened her home to the society on two evenings: Oct. 28 for a special meeting and Dec. 31 for the annual reunion, when each one sharpened his wits at the geography contest.

Once a month the society has deviated 'from wars and rumors of war,' from court etiquette and its enforced form and indulged in the Monday bargain counter, where fact and fiction, pathos and mirth have been offered side by side.—MARY FASSETT GROSVENOR, *Secretary*

PROGRESS CLUB, ANGELICA

The Progress club was organized in 1894 and has a membership of 28. The subject of study for the year was English history and literature from the accession of James 1 to George 4. A period of history was named in advance as a lesson for the next meeting and from 20 to 30 questions were assigned. Contemporary literature and standard histories were read in preparation for the lessons. Occasionally quotations from authors were given and three papers were read at each meeting.

THE TOURISTS, MIDDLETOWN

The club has never adopted a formal constitution, working with as little machinery as possible from an informal beginning and an earnest desire for improvement. The annual meeting

is held the last of September and a president and secretary are elected each year. The country studied the past year was Holland. Four papers or readings are given at each meeting. Photographs and engravings of places and characters studied are used when they can be obtained.

WELLSVILLE MONDAY CLUB

The Wellsville Monday club has entered on its fifth year of existence. The avowed purposes of its organization were the gaining of social and intellectual stimulus and the establishment of a free public library. These hopes have been realized in a most gratifying degree. Social intercourse has proved pleasant and profitable and the library was established in 1894. This was at first dependent on charity for shelter and was several times moved, but is now permanently located and has nearly 3000 volumes, obtained through numerous small gifts of money and books, supplemented by state aid. The library is guided in wise selection of books by state supervision. The buying, classifying, labeling and circulation of books and all the other duties of a librarian are performed voluntarily by members of the Monday club, so that all funds may be used for books. The club numbers about 40 members with an honorary membership of 12, elected for service rendered to the club or library. The subjects of study for the year were geology and civics. Each club member is expected to prepare at least one original paper during the year. It may be asked how busy housekeepers find time for so much outside work? It is answered that the requirements of the club are regarded as recreations, and with the occasional club-teas and entertainments largely supplant other social functions.—MRS A. S. BROWN, *President*

TRAVELERS CLUB, WATERVILLE

This club of 20 members meeting weekly was organized in 1893, its object being to make intelligent travelers of its members. Countries are studied with reference to their natural scenery, industries, people, customs and anything connected with their progress and present condition. A committee of three has charge of the work for each meeting.

SUNDAY SCHOOL PRIMARY UNION CHILD STUDY CLUB, BUFFALO

The objects of the Sunday school primary union are to provide a weekly exposition of the International Sunday school lessons and to promote mutual acquaintance and fellowship among primary workers. The character of the study is pedagogic and biblical but not sectarian.

There are now 106 primary unions distributed as follows: Massachusetts 25; New Jersey 14; Pennsylvania 16; New York 8; Missouri 6; Kentucky 6; Ohio 6; Canada 4; Colorado 2; Connecticut 2; Minnesota 2; Illinois 2; 12 scattering representing 12 states. In addition to the regular Sunday school work of the union a special course in child study was conducted by the president of the Buffalo primary union, Miss Margaret C. Brown. This section of the club numbered 10 enthusiastic workers and met every Saturday for 10 weeks. The topics are printed on p. 311. Blackboard outlines and suggestions were an important part of this work which also included some simple manual training, kindergarten songs and games with papers and discussions.

WOMAN'S CLUB OF RICHMOND CO.

The Woman's club, organized in 1893, has a membership of 110. It is divided into departments representing its different lines of work, philanthropy, social economics, literature, art and science. The officers of the club and the three directors of each department constitute the executive board which appoints from its own body committees on literature, finance and social affairs. General meetings are held on the first Wednesday of each month from October to June. During the past year the literary department studied American literature. A paper was read at each meeting, followed by discussion and questions on American history and literature.

TUESDAY CLUB, GLENS FALLS

The Tuesday club is an informal organization of 25 women meeting weekly with an average attendance of 18. The first meeting of the club was held in October 1896 and History of art

was chosen as the subject of study for the year. After the meetings are called to order by the president the minutes of the previous meeting are read, including usually a short résumé of the literary part of the program. The meeting then passes into the control of one member of the program committee. Topics are assigned one week in advance unless a longer time is considered necessary for preparation, and they may be presented either in the form of a talk without reference to notes or in a paper, supplemented with readings, photographs or other illustrations. After each subject there is an informal discussion during which questions often arise which are assigned as special or general topics for further research to be presented at the next meeting.

WATERTOWN LITERARY CLUB

The study of English and continental literature has been taken up following the questions prepared by Miss Louise Maertz. Each student prepares the answers to a certain number of questions. These answers are recited and discussed informally. A copy of the answers is preserved forming a book for future use.

PORTFOLIO CLUB, SYRACUSE

The Portfolio club organized in 1875 has a limited membership of 30. Meetings are held regularly on Monday afternoons beginning Oct. 1 and closing the second Monday in April. The subject of study for 1895-96 was Under our own roof tree, a century of American living and thinking and was supplementary to a year devoted to America, its history, resources, industries, art, literature, government, etc. Each member of the club prepares one paper on an assigned topic during the year. Besides the regular afternoon meetings, several evening meetings are held when addresses are given to the club by professional men of the city and guests are invited.

SHAKESPEARE CLASS, BINGHAMTON

This class was formed in 1895 but has no formal organization. Shakspeare's English history plays were studied during the year, from three to five meetings being devoted to each play. A leader

assigns the work to be done by members. The reading of the plays is followed by discussion and references to Rolfe's notes. The history of the time is made clear by a brief reading from some standard authority and the principal characters in each play are described in the same manner. A critic is appointed at each meeting who makes a report of mistakes in pronunciation and rhythm and misstatement of facts. The Roman history plays will be studied next year.

ADDISONIAN CLUB, WARSAW

The Addisonian club organized in 1887 has a membership of 13 men and 22 women. American history and current topics were the subjects for the year. The club does not follow the plan of making a complete program at the beginning of the year but every third month appoints a new committee of three members who arrange the program as they wish though keeping to the subject previously chosen by the club.

EMERSONIAN READING CLUB, PIKE

This club composed of 35 women has been in existence since 1879 and is purely literary in its character. American literature has been studied for four years, and it is planned to make a thorough study of the subject. The New England writers were completed in June 1896 and the writers of the middle eastern states will be taken next. The programs consist of discussion supplemented with readings and one or more papers. The club owns a library of the standard works of history, biography, poetry and fiction.

RENSSELAER COUNTY FARMERS CLUB

The Rensselaer county farmers club has a membership of 125 men and 25 women. At each meeting a question box is opened and the questions are discussed. Then two or more papers are read on subjects relating to farming and opportunity is given to question the writer. Two institutes are usually held every winter and an open air meeting to which state speakers are sent is held in August each year.—OSCAR J. LEWIS, *Secretary*

COTERIE, DANSVILLE

History has been studied for several years by this club but in 1892 the Coterie voted to become a tourist's club and in honor of the Columbian year took up travel in Spain. This was followed by travel in Italy, Austria and Germany. In 1895-96, 24 meetings were devoted to the 16th century of European history and six meetings to outline history of Russia.

It is only for the past three years that the program for the year has been arranged in advance and printed, the topics usually being given from notes followed by informal discussions. Meetings are held weekly from October to May. The 20th anniversary of the Coterie was celebrated on Oct. 31, 1893.

RURAL READING CLUB, TROY

The Rural reading club was organized in March 1896 for the purpose of studying agriculture. It has 10 members three of whom are women. Meetings are held monthly but books are exchanged weekly.—JAMES J. BRODIE, *Secretary*

WOMAN'S INVESTIGATING CLUB, BUFFALO

The Woman's investigating club was organized in 1888 and has a membership of 72, meeting weekly from October to April. The object of the club is the discussion of various phases of woman's life and work and the highest development of its members. A feature of each meeting is an oral discussion by 10 members of the club selected in alphabetic order. These topics include such questions as: How shall the liquor traffic be controlled; Effect of the income tax; Woman wage earners; Art of conversation; etc. The literary work of the past two years has been the study of France, its history, art and literature. One paper is read at each meeting.

SHAKSPEARE CLUB, CANISTEO

30 regular meetings were held the past year, 12 devoted to the study of German literature and five to the lives of great men. *Undine* and *King John* were read and the club also studied civil government. The club consists of 20 members and the average attendance is 15.

MONDAY CLASS, BUFFALO

The Monday class of Buffalo was organized in 1885 and consisted of six members; at present membership is limited to 25. From the first the work has been distinctively literary, the aim being to draw out the individuality and originality of its members. American authors and their works were studied for the first three years; the next three years were spent in the study of Shakspeare and his plays, several being read entire with characters assigned to members. Three years were given to English history and literature, and one year to Germany, its history, art and literature. Last year the history, art and literature of Italy to 1680 was studied; this year the work will be carried to 1800 and during the next year, Italy of the 19th century will occupy the year's program. In addition to the paper two or three talks of 10 minutes each are given without notes; these have proved of great value to all. At each session 20 minutes is given to the discussion of current topics under the charge of the vice-president. A reading from the author of the day closes the program.—*Mrs J. W. GROSVENOR, President*

FORTNIGHTLY CLUB, CANASTOTA

The Fortnightly club held its first meeting Oct. 14, 1895 and 15 meetings were held during the year. The subject of study chosen for the first year was the Age of Queen Anne and this occupied the first part of each evening's program. The last half hour of each meeting is taken up with discussion of current events under the leadership of a member appointed.

HOME STUDY CIRCLE, WATERVILLE

In the 23 meetings held during the year the Home study circle made a study of English history and literature from the conquest to the commonwealth. Papers were prepared on the following subjects: Influence of Italian literature on English literature, Dawn of the drama, Minor dramatists, Minor poets of the Elizabethan age. One afternoon was devoted to Sir Philip Sidney, Lord Brooks and Edward Dyer.—*ALICE C. CLARKE, Secretary*

SOROSIS, BOLIVAR

The club was organized in May 1895, meeting weekly. At first no special work was adopted but selections were read from standard authors and several social entertainments were given. As the club organization strengthened, however, systematic work in United States history and American authors was begun and successfully carried on.

HENDRICK HUDSON CHAPTER, D. A. R., HUDSON

The chapter was organized in 1895 with 37 members. The constitution is that of the national society of the Daughters of the American revolution and the order of exercises is the same as suggested in the by-laws of the society; i. e. the Lord's prayer, minutes of last meeting, reports of treasurer and committees, general business and a literary program of papers, etc. closing with singing of the *Star spangled banner*. Meetings are held monthly and all have been devoted to the study of American history.—MARY E. JONES, *Secretary*

NATURAL SCIENCE SOCIETY, OLEAN

The Olean natural science society was organized in 1895 for the study of the fauna and flora of the vicinity, the investigation of local geology, paleontology, ethnology, archeology and kindred sciences, thus bringing its members into a closer and more sympathetic relation with nature. The following departments of study have been established: zoology, ornithology, entomology, ichthyology, geology, paleontology, ethnology including local history, botany, dendrology and microscopy.

A standing committee for each department is appointed by the president for each year. Each committee outlines its own work and prepares the program for the evening assigned to it. Meetings are held monthly except in July, August and December.

HISTORICAL CLUB, MIDDLETOWN

In March 1896 five ladies began holding informal meetings weekly for the study of history and in the following October a permanent organization was formed consisting of seven members. Egypt was the subject chosen for study and the work has covered

not only the rise and fall of the Egyptian empire, but a careful study of its art and architecture, cities, tombs and the manners and customs of its people. The work of the club was made possible by an admirably selected library furnished by the state containing records of original researches thoroughly illustrated, copies of manuscripts and the latest authoritative works on the arts and life of the people, making possible an entirely reliable study of all the phases of Egyptian life and history.—Mrs C. C. LUCKEY, *Secretary*

FORTNIGHTLY CLUB, BINGHAMTON

The Fortnightly club was organized in November 1895 and held 13 meetings. The object of the club is to study Shakspeare and the plays read were *King Henry 5* and *Hamlet*. In connection with the first reading Lucy A. Leggett's questions were used. After finishing the play a committee is appointed to arrange a final reading for one or two evenings for which parts are assigned and some of the less important scenes omitted.

TRAVELERS CLUB, ILION

The Travelers club of Ilion was organized in 1890, for the study of history. The active membership is limited to 40 with 10 associate members during the past year. Meetings are held on alternate Tuesdays from September to June. The course of study for the first three years was Italy; the next two years, Germany; the last two and the coming year, France, after which it is planned to study England.

The work consists of research, generally given in the form of conversations followed by discussions, with an occasional reading and talks illustrated by the stereopticon. Three extra programs were devoted last year to current topics. The social functions of the past year were a reciprocity day, when the Progressive club of Herkimer, the Historical club of Ilion and 25 representatives of the New century club of Utica were entertained; and President's day which is the regular social event of the year.—IDA DOTY WHITFIELD, *Corresponding secretary*

UNDENOMINATIONAL MISSIONS CLUB, ILION

The object of the Undenominational missions club is to interest as many as possible in the whole subject of missions; believing that interest comes with knowledge, the club will make a study of the mission work of the world from the beginning of Christianity to the present time. The meetings are open to all who care to come. Those who sign as members expect to be called on for papers though this work will not be confined to them.

WIDE AWAKE CLUB, FILLMORE

The Wide awake club was organized in 1896 and has been studying American history and civics. 15 minutes are devoted to discussion of current events and 15 minutes to answering and discussing practical questions asked by members. The club is actively interested in establishing a library in its town.

ROUND TABLE, JOHNSTOWN

The Round table was organized in 1894 for the improvement of its members by wider research of historical and biographic subjects. 14 meetings were devoted to the study of English history and 57 papers were read during the year. Discussion follows the reading of every paper. Before the close of the meeting the principal subject of the evening is reviewed and any important events in the previous week are reported and discussed.

BLAUVELT READING CIRCLE

The Blauvelt reading circle was organized in 1894 and has a membership of 19. Meetings are held weekly devoted to the reading of American history and literature. There are two readings on history at each meeting followed by discussion and music. The life of the author under discussion is then read with extracts from his works. A committee of reference is appointed to hear and determine all questions submitted to them by the circle and to prepare and announce a program for each meeting. In selecting readers, members are appointed in turn.

EASY CHAIR READING CIRCLE, WEST NEW BRIGHTON

The Easy chair reading circle is composed of 12 women who meet weekly throughout the year and read in turn for two hours.

The readings for the past year were on Spain and Holland. Reference books and dictionaries are freely used at the meetings but questions requiring much time and research are assigned to members to look up at home and report at the next meeting. After the reading an informal discussion is held while tea is served. An important rule of the club is that each member shall read not less than 15 minutes each day and shall pay a fine if a day is missed.—ANNA E. SIMONSON, *Secretary*

EAST SIDE STUDY CLUB, SHERMAN

This club was organized in 1890 as the Browning club, taking its present name in 1896. The club consists of six members living at one end of the village who meet weekly from October to May. The work is carefully done and adds much to the life of each member.

NEW YORK STATE FEDERATION OF WOMEN'S CLUBS

This organization has from the first made its educational work so prominent that it has been considered appropriate to give here a brief summary of its work. The initiative in the movement for organizing a New York state federation of women's clubs was taken by Sorosis, at whose invitation 118 delegates assembled at Sherry's, New York, Nov. 19-20, 1894, Mrs William Tod Helmuth, president of the club, presiding. Officers were elected and a constitution and by-laws adopted. The object of the federation as stated by the constitution is to bring into relations of mutual helpfulness the various clubs and organizations of women throughout the state. At the suggestion of the first president, Mrs J. C. Croly, the clubs are grouped according to the main purpose of their organization and include literary and educational, scientific, professional, industrial, philanthropic, municipal and village associations. The president of each federated society is a vice-president of the state federation. The general officers of the federation and eight vice-presidents or others elected from the membership constitute an executive board. To join the state federation a club must apply through its corre-

sponding secretary to the executive board and submit a copy of its constitution and by-laws.

The first annual congress was held in Brooklyn, November 1895. At this meeting it was suggested that a Bureau of educational correspondence should be formed to aid the clubs by furnishing outlines for study and thus supplementing the work of the New York extension department. This suggestion was acted on at the first meeting of the new executive committee and Mrs Frances Hardin Hess was appointed chairman of the bureau. The report for the first year states that 20 clubs have exchanged programs, over 60 clubs have been aided in formulating courses of study, three state federations have been assisted and two individuals directed in study by the efforts of the Correspondence bureau. Methods of rousing interest in university extension work have also been considered and a syllabus on music by Mrs Mary Platt Parmele was published for the bureau by the Extension department.

MICHIGAN STUDY CLUBS

In February 1896 the Michigan state library sent out circulars to the various study clubs in the state asking for reports and programs of study, and in May a study club bulletin was published, the plan and style of which corresponds in scope and arrangement to the study club bulletin issued in 1895 by the New York extension department. Reports of 113 clubs are given followed by programs of study selected from those confined to a single subject; at the end is given a table of study outlines used by Michigan clubs, 1874-95; and a list of such outlines on file in the Michigan state library.

Programs of the following New York clubs were reprinted from the New York Extension bulletin: Medina culture club; Olean traveler's club; Hamilton fortnightly club; Woman's ethical club, Rochester; Woman's literary club, Dunkirk; Every Saturday night club, Waterville; Potsdam fortnightly club; Jamestown fortnightly club; Society for study of child nature, New York. According to the Michigan library law of 1896, traveling libraries are sent out from the state library and so far as possi-

ble, special subject libraries will be sent to clubs making application. The Michigan state library will also aid the clubs in arranging outlines of study and preparing lists of books.

SYLLABUSES

NEW SYLLABUSES PRINTED BY THE UNIVERSITY, OCT. 1, 1895—SEPT. 30, 1896

To the 52 syllabuses reported in *Extension bulletin* 11, have been added no. 57-64 all of which are planned for 10 weeks continuous work at extension centers or study clubs. Price in quantities to registered clubs two cents for each eight pages; single copies at prices specified. A complete list may be had on application.

- S 57 Jackson, A. V. W. *Professor of Indo-Iranian languages, and sometime adjunct professor of the English language and literature, Columbia University.* Ancient India and Persia: their literature and their civilization. 24p. Nov. 1895. *Price 5 cents.*
- S 58 Scott, W. B. *Professor of geology, Princeton University.* Zoologic geography. 14p. Nov. 1895. *Price 5 cents.*
- S 59 Mills, H. E. *Professor of economics, Vassar College.* The labor problem. 44 p. Nov. 1895. *Price 10 cents.*
- S 60 Rice, R. A. *Professor of history and director of art association, Williams College.* America and Europe in the 18th century. 12 p. Dec. 1895.
- S 61 Goodyear, W. H. *Curator of archeology, ethnology and fine arts, Brooklyn Institute.* History and criticism of Italian art and of painting by the old masters. 17 p. Feb. 1896. *Price 5 cents.*
- S 62 McMurry, F. M. *Professor of pedagogics, University of Buffalo.* Pedagogy. 18 p. March 1896. *Price 5 cents.*
- S 63 Dunning, W. A. *Adjunct professor of history and political philosophy, Columbia University,* and Cushing, H. A. *Tutor in history, Columbia University.* European history since 1815 with special reference to the continent. 28 p. Aug. 1896. *Price 10 cents.*
- S 64 Parmele, Mrs M. P. Music; its evolutionary development. 14 p. July 1896. *Price 5 cents.*

OUTLINES OF STUDY

The collection of study club programs which is being made by the extension department is constantly increasing and is of great interest and value to study club workers. While first copies are kept at the state library for reference by those who come to Albany for the purpose, duplicates are lent to members of the program committee of local clubs on application. To complete this collection and to render it widely useful through its duplicates, each club member is urged to send to the Extension department every study club program or similar outline of study that he is willing to contribute for the benefit of the clubs throughout the state.

The outlines published last year have been found to be of so much service that a few more have been selected and are here printed. Some programs of Michigan clubs are reprinted from the Michigan study club bulletin.

Subj. no. 100

PHILOSOPHY

Buffalo Sunday school primary union child study club

1896

1 Unity: there is but one

Study, God

Science, life

Motive, growth

Means, lawful practice

Law, self-effort

Soul attitude, openness to truth

Result, spiritual freedom

2 Trinity

The child

of nature (physical life)

of humanity (social life)

of God (spiritual life)

3 Forms of life

Energy matter-form

Fröbel's organized material

Noumena and phenomena

4 Sense education

Physiological and psychological law applied

The great telegraph system: sensor and motor nerves applied

Common sense — what is it?

5 The science of life (illustrated by Fröbel's *Mother plays*)

Work is the corner-stone of character; experience; conquest; fellowship; blessing; honor; worship; freedom; god-likeness

6 Three primal factors

Heredity. Personality. Environment

7 Chivalry,

Relation of individual and race

Ideal manhood

'I serve' (*Ich dien*)

8 The emotions

'I feel'

Myself (egoism)

My neighbor (altruism)

My God (montheism)

9 Self-determination; self-climax

Deliberation. Choice. Action

10 Spiritual freedom; warfare and victory

Tendencies low and high

Upward tendency has power over lower tendency

Ideal character

Subj. no. 320

POLITICAL SCIENCE

Lansing (Mich.) Twentieth century club

1 Municipalities, how constituted

City officers, elective, their duties and responsibilities

City officers, appointive, their duties and responsibilities

Common council

Boards, how created, and their function

Paper: How women are concerned in village and city government

2 City taxes; school taxes; highway taxes

Election, and how conducted

Ordinances

Paper: Municipal woman suffrage, its effect in Kansas and elsewhere

3 How are townships laid out?

Relation of township to town and county government

Township officers

To whom do the roads of a town belong?

Which existed first, townships or counties?

Paper: The value of woman's services in the home-making partnership

4 School districts and board

How are schools supported?

What is the permanent school fund and whence does it come?

How may school tax be levied?

Can a school district borrow money and how?

Who may vote at school elections?

Paper: Why women should become members of school boards

5 How and when is a county organized?

County officers and their duties

Boards of supervisors, how constituted?

What are their salaries? Their chief duties?

How many members in your county?

Who are county and who are township poor?

How may a county seat be established? How removed?

Who determines the amount of money to be raised annually?

What is the length of term of county officers?

Paper: Women as taxpayers

6 When was our present constitution adopted?

Why was the old constitution changed?

Under what condition may Michigan amend her constitution?

What are the departments of government?

What are the three qualifications for governor?

What is the compensation of governor? Of lieutenant-governor? How paid?

How does the governor share the power of the legislature?

Papers: Women rulers in history

7 How are senatorial districts created?

How are representative districts created?

When does the legislature meet? About how long does it continue?

What is the compensation of members?

Describe the method of organizing the house; the senate

How do bills arise, pass, and become laws?

Give the 'enacting clause' of Michigan

Paper: Woman's influence on the past 50 years of legislation

8 Name the officers of the supreme and circuit courts. By whom are they elected or appointed?

What is a municipal court? A probate court?

What are the duties of the circuit court commissioner?

What are the grand and petit jurors?

When is a jury trial guaranteed?

What are notaries public and by whom appointed?

What are state tax; county tax; county road tax; agricultural tax; bridge tax; soldiers' tax; how levied and collected?

Paper: Women as lawyers

9 What classes may vote under the constitution of Michigan?

Who are debarred from voting?

What are the restrictions as to residence?

How may an alien become a voter?

What are the boards of registration, inspectors of elections, and boards of canvassers?

When and where may a voter register?

Give the times of regular elections

What is a caucus and how called?

Describe the Australian ballot

Paper: Women a moral power in politics

10 Declaration of independence

History of the origin of the U. S. constitution

History of the amendments to the constitution

**Paper: First woman suffrage convention in Seneca Falls, N. Y.
July, 1848**

11 In whom is the national government vested?

Describe the election of president and vice-president

When is the presidential election held?

What is the salary of the president? Of the vice-president?

Name the cabinet officers; how appointed; what are their salaries?

Paper: History of woman's effort to secure a 16th amendment

12 Who are the members of the senate; how are they elected?

Age of candidates; term of office; salary

How are members of the house of representatives elected?

How many senators and representatives has Michigan?

How many judges has the U. S. supreme court?

How appointed and what are the terms of office?

When are the sessions of court held?

Paper: Woman suffrage in Wyoming

References

Civil government	H. R. Pettengill
Civil government of U. S.	W. S. Hewitt
Michigan manual	
History of Michigan	
History of U. S.	
City charter	

Subj. no. 640

HOUSEHOLD ECONOMICS

Woman's club, Charlotte, Mich.

1 The building of the home

From cellar to attic

Use and abuse of ornamentation

Home keeping vs housekeeping

2 Physiological effect of light and heat

Different methods of heating the home

Sunshine, the light and life giver

Ventilation and plumbing

- 3 Chemistry of cookery
 - Hygienic value of different methods of cooking
 - How may our modern methods be improved?
 - How to select and purchase food
- 4 Nutritive value and digestibility of food
 - Advantages and disadvantages of a meat diet
 - Demonstration: how to select meat
 - Food value of starches, sugar and fats
- 5 Nutritive value of fish
 - Oysters and oyster culture
 - Turtle, shell-fish and mollusk
- 6 Hygienic value of vegetables
 - Proper cooking of vegetables, cereals and legumes
 - Rationale or vegetarianism
 - The Aladdin oven
- 7 Milk as a food
 - Butter
 - Butterine
 - Suet, lard and their compounds
 - Cocoanut butter
- 8 Cheese, the universal food
 - Eggs: their food value and proper cooking
 - Demonstration: the chafing dish
 - Essentials of a model cook-book
- 9 Maple sugar
 - Plain sugar, sorghum and honey
 - Sugar-beet industry
 - Jellies and marmalades
- 10 Flour and other prepared cereals
 - Bread, the staff of life
 - Bread of different nations
 - Chemistry of bread making
 - Macaroni and pastes
- 11 Food value of nuts
 - Fruits as food and medicine
 - Fruitarian theory
 - Healthful desserts

12 Aromatic herbs**Spices of the Orient****Sauces, flavors and cordials****Chilis and pickles****13 Coffee, its history and usage****Tea****Chocolate and cocoa****Mate****14 Water****Pure water vs disease****Water as a cleansing agent****Ice and ice supply****15 Food of civilized Europe and America****Food of the Eskimos, Laps and Alaskan Indians****Food of the Asiatic peoples****Food of the natives of the tropics****16 Economy in the use of food****Adulteration of food****Theory of cooperative housekeeping****Household science in the public schools****17 Chemical effect of bacteria on food****Nature and growth of bacteria****Bacteria as factors in disease****Sterilization of food****18 Life and work of Count Rumford****Housekeeping in the 20th century****Health and dress reform****References****Science of nutrition****Chemistry of cooking****Atwater's reports****Food products of the world****Household science****Edward Atkinson****W. Mattieu Williams****Youmans****Dep't of agriculture, Washington****Mary E. Green, M. D.**

Recommended by the Michigan federation of woman's clubs

1 Individualism vs altruism

Ascent of man economically

Review Drummond's *Ascent of man*, ch. 8, 9

Relation of household economics to life

Division of labor; its significance

Cooperation: schemes of; reason for failure

References

Place of woman in primitive culture	O. T. Mason
Our homes	Dr Henry Hartshorn
Dynamic sociology	Lester F. Ward
The two paths	John Ruskin
Man and woman	Havelock Ellis

2 Influence of home on society and state

Evolution of the house, from hut to palace

An ideal home, and its moral influence

Air, light and sunshine in the home; the best disinfectants

Science of color, effect of color in dress

Household architecture

References

Homes and how to make them	E. C. Gardner
House building	Helen Churchill
Our colonial homes	Samuel Adams Drake
Story of my house	G. H. Ellwanger
The house beautiful	W. C. Gannett
Also various histories of architecture	

3 Laws and principles of decoration

Art and utility in the home

Esthetics in the household

Beauty as a moral agent

Artistic sins and their moral counterparts

References

Hints on household taste	Sir Charles Eastlake
The house beautiful	Clarence Cook
The house comfortable	Agnes Ormsby
House decoration	Rhoda & Agnes Garrett
Art and formation of taste	Lucy Crane
The city without a church	Henry Drummond

4 Nutritive function of the household

Nutritive value of food products

Use and abuse of meats

Fruit as food and medicine

Moral influence of diet

The Atkinson oven and Rumford kitchen

References

Food and feeding	Sir Henry Thompson
Chemistry of cooking	W. Mattieu Williams
The perfect way in diet	Dr Anna Kingsford
Science of nutrition	Edward Atkinson
Foods	Edward Smith
Course of elementary biology	John Bidgood

5 Waste and economy in the home

Waste of time and strength

Making the best of things; utilizing material at hand

Conveniences; the right to be comfortable

Care of garbage and waste

Scientific cleaning

Moral and physical results of cleanliness

References

Just how	Mrs A. D. T. Whitney
Mrs Herndon's income	Helen Campbell
Ten dollars enough	Catherine Owens
Dust and its dangers	T. Mitchell Prudden
Chemistry of cleaning	Vivian Lewis

6 Cooking as an art; a science; a handicraft; a profession

Good cooking as a civilizing factor and a moral agent

Marketing

Dietaries for infancy, childhood, youth, maturity and age

Foods for invalids. The invalid room

References

Practical, sanitary and economic cookery	Mary H. Abel
In the kitchen	Mrs E. S. Miller
Chemistry of common life	J. F. W. Johnson
Foods for the fat	Dr C. W. Green
Handbook of household science	Edward Youmans

7 Household industries; woman as a factor in the labor problem

Effects of special industries on body and mind

Exercise in relation to health; mental life; morals

Relation of income to expenditure

The kitchen: location, structure, furnishings, relative to life of the family

References

Home handicrafts	Charles Peters
Women wage earners	Helen Campbell
Physiology of bodily exercise	Ferdinand Lagrange
Physiology of common life	James Johnston
The easiest way in housekeeping	Helen Campbell

8 Ventilation: home, public buildings, school

Sanitation: who is responsible for the sanitary condition of buildings?

Drainage, private and public, its history, present methods and tendencies

References

Hygeia, a model city of health	Dr Benjamin W. Richardson
Women, plumbers and doctors	Mrs H. M. Plunkett
Sanitary house inspection	W. P. Gerhard
How to drain a house	George E. Waring

9 Woman's work: as a wage earner; as house mother in a community

How to simplify housekeeping

Question of service; from standpoint of mistress, from standpoint of maid

Dress, in its relation to beauty, health, comfort and morality

References

The servant question	Harriet Prescott Spofford
Domestic service	Mrs C. L. Stone
Domestic service	E. P. Whipple
Prisoners of poverty	Helen Campbell
The Biddy club	Griffith Nicholas
Cooperation	Mrs O. L. Pierce
The evolution of woman	Mrs Edna Proctor Gamble

Subj. no. 759.4**FRENCH PAINTING***Monday art club, Middletown***1 Early French school, Jehan Fouquet and Jean Cousin**

François Clouet, Jacques Callot and Simon Vouet

- 2 Times of Louis 14
Nicolas Poussin
Claude Lorraine
- 3 Eustache Le Sueur and Charles Le Brun
Pierre Mignard, Rigaud and Millet
- 4 18th century before the revolution
Antoine Watteau
- 5 Jean Baptiste Greuze
Jean Baptiste Simon Chardin
François Boucher and Claude Vernet
- 6 The revolution and the first empire
David and the rise of classicism
Pupils and followers of David
- 7 Pierre Prud'hon and Guerin
Madame Le Brun
- 8 Gericault
Eugene Delacroix
- 9 Paul Delaroche and Thomas Couture
Ary Scheffer
- 10 Horace Vernet
The Orientalists, Decamps and Fromentin
- 11 The modern landscape school and Theodore Rousseau
Jean Baptiste Camille Corot
- 12 Daubigny
Diaz
- 13 Jules Dupre
Jean François Millet
Constant Troyon
- 14 Rosa Bonheur
Meissonier
- 15 Henri Regnault
Gustav Courbet
- 16 Jules Breton
Impressionism in France

**Subj. no. 759.5 DEVELOPMENT OF ITALIAN PAINTING IN THE
RENAISSANCE**

Literary society, Prospect av. Baptist church, Buffalo

1894-95

Keynotes; creative centers; dominant motives

Stages of development: mysticism, realism, classicism, fusion,
decadence

MORNING

1 Awakenings of art

Foregleams

In Pisa, Guinta

In Siena, Guido and Duccio

In Florence, Cimabue

Dawn: Giotto, the master

Pupils and followers: The Lorenzetti, Simone Martini,
Taddeo Gaddi, Orcagna

Conversation: Literary contemporaries of Giotto and their
influence on art; Dante, Petrarch, Boccaccio

2 Development of dramatic element in painting

Lights and shadows

Masaccio, the pioneer of realism

Fra Angelico

Sandro Botticelli

Paolo Uccello

Domenico Ghirlandajo

Piero della Francesca

The Bellini

Benozzo Gozzoli

Pietro Perugino

The Lippi

Fra Bartolommeo

Conversation: Influence of the Medici on art

NOONTIDE

3 Leonardo da Vinci, 'the wizard of the renaissance'

Great attainments and unfinished results

Andrea del Sarto, 'the faultless painter'

4 Michel Angelo, 'the seer'

Style, individuality, power

Michel Angelo, the man, as illustrated in Longfellow's dra-
matic poem, *Michael Angelo*

5 Raphael, 'the melodist'

Blending of all elements into a harmonious whole

6 Correggio, 'the faun'

The master of chiaroscuro

Beginning of art for art's sake.

7 The Venetian masters of color

Titian, 'the painter'

Tintoretto, 'the dramatist'

Paolo Veronese

Conversation: Painting as an expression of Venetian life

8 Masterpieces of the renaissance

DECLINING DAY

9 Shadows of the masters

Bernardo Luini and the school of Leonardo at Milan

Guilio Romano, Sodoma and the pupils of Raphael in Rome

Francesco Mazzola and the copyists of Correggio

Sebastiano del Piombo and the imitators of Michel Angelo

10 The afterglow

Guido Reni, Domenichino, and the school of Bologna

Caravaggio and the school of Naples

The later Venetians

Conversation: The artist and his public

11 Types of contemporary art

Subj. no. 808.3 THE MODERN NOVEL

Novel club, St Louis, Mo.

1 Discussion of the criticism of fiction

2 *The Pilot and his wife.*—Jonas Lie

Pride and jealousy in married life

Elizabeth's subserviency and lack of tact

The European emigrant's contribution to our national character

3 *Story of my dictatorship.*—Anonymous

Single tax

Compensation

- 4 *The two Salomes*.— Maria Louise Poole
 The puritan conscience; its development, possible future,
 and present reliableness
 Does our code of morals need readjusting?
 Forgery and a loveless marriage
- 5 *Dame Care*.— Herman Suderman
 The sense of responsibility
 The boundary line between duty to self and others
 The 'pattern boy'
 Sentiment and sentimentality
 Mothers in fiction.
- 6 *Katharine Lauderdale*.— F. Marion Crawford
 The society environment
 The code of honor
 Value of genealogy and family pride
 Is the absence of business capacity a fatal weakness?
 Is the supremacy of business a bar to civilization?
- 7 *Bartek, the victor*.— Henry Sienkiewicz
 Some of the influences constantly increasing the submerged
 tenth
 War as an educator
 Is Bartek a case of arrested development?
- 8 *An imperative duty*.— W: D. Howells
 Mrs Meredith's duty
 Heredity
 The place of truth among the virtues
 Our race's responsibility
 Is Howells just to women?
- 9 *Marcella*.— Mrs Humphry Ward
 Young women and labor problems
 The English nobility and labor problems
 Socialism
 Is Marcella less lovable than Katharine Lauderdale?
- 10 *The Virginians*.— Thackeray
 A comparison of this, and similar standard works, with the
 modern novel in style, character drawing, incident, influ-
 ence and usefulness
 The influence of Henry Warrington on the modern youth

Subj. no. 322. 33

SHAKSPERE

Fredonia Shakespeare club

1895-96

ELIZABETHAN DRAMA

Lyly, Peele, Greene, Kid

1 Paper: Distinguishing features of the Elizabethan drama:
how it differed from the classical, the French, the German

Talk: Early English poets

Read Marlowe's *Edward 2*

2 Paper: Special characteristics of the dramas of Lyly, Peele,
Greene and Kid: their prose works and the use Shakspeare
made of them

Discuss the difference between the real and the imitation

Read *Edward 2*

Compare with Shakspeare's *Richard 2*

3 Read Shakspeare's *Richard 3*

Consider the play from the side of plot, and discuss the Nem-
esis action

Compare with Marlowe

SECOND DRAMATIC PERIOD

Shakspeare, Jonson, Dekker, Chapman, Marston

4 Paper: Life, works and influence of Ben Jonson

Read Jonson's *Every man in his humor*

Sub-topic: Shakspeare as an actor

5 Finish *Every man in his humor*

Paper: The mask as a form of dramatic art

Read Milton's *Comus*

6 Paper: Alchemy

Read Jonson's *The alchemist*

Discussion

7 Finish *The alchemist* and read *The silent woman*

Discussion

8 Paper: Thomas Dekker

Read *Old Fortunatus*

- 9 Paper: Chapman and Marston: their contribution to dramatic art
 Illustrative readings from Chapman and Marston
- 10 Read Shakspeare's *Romeo and Juliet*
- 11 Finish *Romeo and Juliet*
 Discuss the play from an artistic standpoint
 Query: Did Shakspeare stand alone, or did he only differ in degree from his contemporaries?

THIRD DRAMATIC PERIOD

- Beaumont, Fletcher, Middleton, Webster, Heywood, Tourneur,
 Shirley
- 12 Paper: Play houses and play actors of Old London
 Paper: Sketch of Beaumont and Fletcher, with special reference to what each contributed to English drama
 Read selections from Middleton, Heywood and Tourneur
- 13 General discussion
 Causes of the decline of dramatic strength at this time
 Outline of Beaumont and Fletcher's *Philaster*
 Read *Philaster*
- 14 Finish *Philaster*
 Read Shakspeare's *Twelfth night*, and compare
- 15 Read Beaumont and Fletcher's *King and no king*
 Talk: Pastoral dramas of the Elizabethan age
- 16 Paper: Italian stories; a favorite source of plot with the 16th century dramatists
 Sketch of Webster; his distinguishing traits
 Read Webster's *Duchess of Malfi*
- 17 Read *Duchess of Malfi*, and discuss
 Paper: Dramatists of the decadence
 Read Ford's *Broken heart*
- 18 Paper: The estimate of Shakspeare by his contemporaries
 Read *Broken heart*
 Discuss the difference in the opinion of critics in regard to this play

- 19 Paper: How is the decadence of the drama foreshadowed in the writers of this period?
Read and discuss Massenger's *A new way to pay old debts*
- 20 Read Shakspeare's *As you like it*
- 21 Finish *As you like it*
Discuss and compare with dramas previously read
Talk: Shirley, the last of the Elizabethan dramatists
Extracts from his plays
- 22 Paper: Milton, the last of the Elizabethans
Read *Samson Agonistes*
Discuss resemblance to the Greek drama
- 23 Paper: Rise and growth of puritanism and its effect on the drama

Subj. no. 822.33

KING LEAR

Prepared by Mrs Cyrus Smith, Lansing, Mich.

PRELIMINARY QUESTIONS

- 1 Define art. On what psychological principles is the study of all art based, and through what stages of development must all art pass?
- 2 Name the various departments of art. Define the art of poetry, and give its subdivisions
- 3 Define and give several examples of 1) an epic poem; 2) a lyric poem; 3) a dramatic poem
- 4 Show why dramatic poetry has greater influence on human life than epic or lyric poetry
- 5 Before Shakspeare's time, who had been the greatest dramatic poets of the earth? Give examples of their works
- 6 Who have been the great dramatic poets since Shakspeare's death? Name some of their works
- 7 Compare the Shaksperian drama with the ancient Greek drama, and point out Shakspeare's superiority as a dramatic poet
- 8 Into what classes are the Shaksperian dramas grouped? Define each, and name the plays belonging to each class

- 9 Explain Shakspeare's system of morality and ethics, as set forth in the plays
- 10 With what institution in the ethical world does *King Lear* deal?
- 11 During what period of the world's history is the *King Lear* of this drama supposed to have reigned? In what country?
- 12 In what year did Shakspeare write his tragedy of *King Lear*? Give internal and external evidence in proof of this date
- 13 Name in chronologic order the great tragedies of Shakspeare. Where does *King Lear* rank among these?
- 14 Was the *Lear* story original with Shakspeare? If not, what was its source?
- 15 From what source did the poet obtain the *Gloster* story?
- 16 Does it detract from Shakspeare's greatness as an artist, that he was a borrower of plots?
- 17 Why did he, in this drama, weave the *Lear* and the *Gloster* stories together? Show his art in so doing
- 18 Name the principal characters in 1) the *Lear* story; 2) the *Gloster* story. Are any of these original with Shakspeare?
- 19 What is the theme of this drama? What is the general character of the people and the world into which it introduces us?
- 20 Shakspeare has two methods of presenting his heroes, and the consequent action of his dramas. (Compare *Lear* and *Othello* with *Hamlet* and *Macbeth*) Explain the two, and state which method he employs in this play

Act 1, scene 1

- 1 Where is act 1, scene 1, located? How does it differ from the first scene of every other play of Shakspeare?
- 2 Who is Kent and what is his relation to Lear?
- 3 What does the first sentence of the play indicate as to Lear, which is proved by subsequent events?

- 4 Interpret Gloster's reply to Kent's remark, and tell what it shows of Gloster's relation to Lear
- 5 What may we judge of Gloster's character from his confession, which follows?
- 6 What do you judge of Kent's character from his expressed opinion of 'the fault'?
- 7 What may we infer of the conditions in the Gloster family, from what is revealed to us in this conversation?
- 8 From an ethical standpoint, how must we regard Gloster's act?
- 9 For what does the poet, with great art, prepare us, in this much of this scene?
- 10 Describe the stage picture of the entrance of Lear
- 11 Interpret Lear's first sentence. In his speech which follows, do you receive any intimation of his having met with opposition in effecting this division?
- 12 Do you believe that in dividing the estate, he had originally intended to make the expressed love of his daughters the basis of division? If not, why does he introduce it here?
- 13 Interpret the two lines preceding his direct address to Goneril
- 14 Paraphrase Goneril's reply. Point out the extravagance of it
- 15 What was the feeling that called forth Cordelia's first 'aside'? What did the poet evidently intend to do in it?
- 16 Make plain each statement in Regan's speech
- 17 What is always Shakspeare's purpose in introducing 'asides' and soliloquies?
- 18 Compare this portion of the drama with the corresponding part of the *Old Leir* drama and show Shakspeare's superiority over the old dramatist
- 19 Quote and cite to prove that Cordelia was Lear's favorite daughter
- 20 What contending feelings caused Cordelia to refuse to express her love for her father?

- 21 Was she right or wrong in refusing to humor him?
- 22 What does this reception of her refusal prove as to his character?
- 23 Relate the history of Hecate
- 24 Who were the Scythians?
- 25 In the long speech of Lear beginning 'Let it be so...' what does the poet intend to convey to us of the spirit of the time?
- 26 Compare this speech of Lear with that of Leir in the ante-Shaksperian drama, and show our poet's masterly treatment of it
- 27 In the scene between Kent and Lear, which follows, is Kent pleading the cause of Cordelia or of Lear? Prove
- 28 On Kent's interference, how does Lear at first attempt to justify his act of disinheritance?
- 29 To whom are the words 'Hence, and avoid my sight' addressed? Prove
- 30 In Lear's speech to Cornwall and Albany, what does he reveal to us of his own character and of his expectations? Wherein does he make a mistake?
- 31 Compare the tilt that follows, between Kent and Lear, with the same scene in the *Old Leir* drama, and show Shakspeare's power in the scene
- 32 In this encounter, what one word will stand for Lear's action? For Kent's? What virtue had Kent which Cordelia lacked?
- 33 What has Shakspeare portrayed for us in the character of Kent?
- 34 What act, of whom, is the source of the dramatic action of the play?
- 35 What further confirmation of Lear's inmost character do we receive from his last speech to Kent?
- 36 What ethical principle does Lear, as king, violate, in surrendering his property to his sons-in-law?

- 37 What one does he violate, as father, in his treatment of Cordelia?
- 38 What may we infer from Burgundy's first speech?
- 39 Show the poet's art in introducing both France and Burgundy here
- 40 In Cordelia's speech, 'I yet beseech...liking' what traits of her character are revealed?
- 41 What qualities does France possess, which seem totally lacking in Burgundy?
- 42 What is further revealed to us of Cordelia, by her farewell speeches to her sisters?
- 43 As you see them in this scene, which appears the stronger, Regan or Goneril? Which the meaner?
- 44 Interpret Goneril's last speech to Cordelia
- 45 Which of these two (Regan and Goneril) understands Lear the better?
- 46 What marked difference in their characters is shown in the last two lines of the scene?
- 47 Up to this point what has Lear renounced?
- 48 What is absolute with him?
- 49 Is he, as yet, a victim of insanity or of passion?
- 50 Some critics pronounce this scene unnatural and absurd.
Discuss

Act 1, scene 2

- 1 Where is scene 2 located? What is its time relation to scene 1? What purpose does it serve?
- 2 Show the characteristic art of Shakspeare in the first 17 lines of the scene
- 3 What two things is Edmund here questioning?
- 4 What is he forced to confess as regards his relation to society?
- 5 What are the two things between which he must make his choice, and which does he choose?

- 6 Interpret his first sentence, and show that it is, in reality, a conclusion, following his questions
- 7 Point out the error of it from a moral standpoint
- 8 What profound moral truth may we urge in excuse for his decision here?
- 9 Against whom are his machinations directed, and according to the law of cause and consequence, on whom must they react?
- 10 What is the plan on which he has decided to begin operations? (Read Bacon's essay on *Cunning*)
- 11 What insight into his character does the last line of the soliloquy give us?
- 12 In what state of mind is Gloster when he enters?
- 13 Show both the poet's wisdom and art, in his treatment of this portion of the scene
- 14 Note the change from verse to prose. Explain Shakspeare's use of each as exemplified here
- 15 Show Edmund's cunning in the dialogue preceding the reading of the letter
- 16 Express in the language of our day, the import of the letter
- 17 In the dialogue which follows, what is very apparent as to the Gloster family?
- 18 So far, in what respects does the main plot coincide with the underplot?
- 19 What does Edmund pretend to assign as a reason for Edgar's writing the letter? Show the cunning of it
- 20 Discuss Gloster's character as evidenced in his remark, 'To his father that so tenderly and entirely loves him'
- 21 What two constructions may be put on Gloster's 'I would unstate . . . resolution'? Which do you prefer? Why?
- 22 Show that it is in keeping with Gloster's temperament to believe in astrology and planetary influences

- 23 Give an account of the eclipses to which the poet here presumably refers. What was the belief of his time in regard to astrology, etc.?
- 24 Is Edmund a believer in these influences? If not, what is his belief?
- 25 Interpret his first line after seeing Edgar
- 26 Explain the meaning of his second sentence, and tell what thought prompted it
- 27 Show the significance of the notes which Edmund signs as Edgar enters
- 28 Why does he introduce the subject of eclipses? Why so soon drop it?
- 29 Show his cunning in his advice to Edgar, in the dialogue following
- 30 What common quality have Edgar and Gloster, and how does Edmund work on it, in each?
- 31 Observe the use of the soliloquy here. What is its purpose in this instance?
- 32 Is there any excuse to be offered for Edmund's determination to ruin Edgar, aside from the fact that his birth was shameful?
- 33 Which is the older of these sons? How do they compare in character, in this scene?

Act 1, scene 3

- 1 Where is scene 3 located? What time has elapsed since the close of scene 2?
- 2 What is the purpose of this scene?
- 3 What do we learn of Lear, from it?
- 4 Of what is Goneril complaining? How does she appear here?
- 5 Has she any right on her side? Discuss
- 6 Interpret her speech 'Old fools . . . abus'd'
- 7 Have we any clue to Oswald's character in this scene?

8 For what does this scene prepare us? Show the poet's dramatic art in this

Act 1, scene 4

- 1 Give location of scene 4, and its time relation to scene 3
- 2 What do we learn from the first speech of Kent?
- 3 Did Shakspeare borrow the fact of Kent's disguise and offer of service from the *Old Leir* drama?
- 4 Describe Lear's entrance. What do we gather from his first words?
- 5 Condense Kent's profession of what he is, into the qualities he possesses
- 6 Was he trying to flatter Lear in answering his questions? If not, what the inference?
- 7 Why do both Kent and Lear use prose here?
- 8 What are the thoughts suggested in Kent's reply to Lear's 'How old art thou?'
- 9 What may we infer from Lear's demand for his fool?
- 10 Describe Oswald's entrance and exit? What does it prove of him?
- 11 What is the effect on Lear, of the Knight's report in regard to Oswald?
- 12 Trace Lear's thoughts and emotions from the time the Knight reenters, to the point when he again asks for his fool
- 13 Show with what subtle art the poet reveals to us (in the few lines preceding Oswald's reentrance) Lear's feelings toward his fool
- 14 What is the first impression we receive of the fool, from what the knight says?
- 15 How do we know that Shakspeare intended us to regard this fool as superior to any other of his fools or clowns?
- 16 What are Lear's feelings when Oswald reenters? Why is he so enraged at the latter's first answer to him?
- 17 How does Oswald regard this outburst?

- 18 For what type of humanity does Oswald stand? Discuss the universality of the type
- 19 Against whom is he placed in exact antithesis? Explain
- 20 Show the first point at which Lear shows evidence of having begun to learn his lesson. What is the lesson he has to learn?
- 21 Did Shakspeare invent the stage fool? If not, what did he do with the one he found on the stage?
- 22 Quote passages from two of Shakspeare's plays (*As you like it*, and *Twelfth night*) to show his conception of court fools
- 23 What do you believe was this fool's age? Why?
- 24 Why was he not brought forward by the poet, till the rupture with moral law had taken place?
- 25 Show the poet's art in introducing him into the drama then
- 26 Define humor and explain the difference between it and the other forms of wit
- 27 Note how Lear speaks to, and how he speaks of, the fool through this scene. What is the inference?
- 28 What was the fool's coxcomb? To whom does he offer it on entering and why?
- 29 Explain 'And thou canst not smile...' Discuss the applicability of the sentiment to-day
- 30 Interpret 'this fellow...coxcomb.' Why does he pretend to wish for two coxcombs?
- 31 Interpret, 'Truth's a dog...' Had he any special intent in the latter part of it?
- 32 Explain the meaning of each line of the fool's speech, beginning 'Have more than thou showest.' What is the thought underlying the whole of it?
- 33 What was implied in 'Then 'tis like the breath...for't?' Discuss the truth of the statement
- 34 Why does the poet make them harp on 'nothing' here?
- 35 Explain the meaning of 'No, faith...snatching.' What abuse is the poet here satirizing?

- 36 In the fool's speech on 'eggs' and 'crowns' what sentence contains an allusion to one of Aesop's fables? Relate the fable
- 37 Interpret the fool's first song
- 38 What may we infer from Lear's question just after?
- 39 Why does the fool introduce songs here?
- 40 Show the poet's art in making the second song reveal to us the beauty of the fool's character
- 41 What do Lear's first words to Goneril reveal?
- 42 Why does the fool address Goneril as he does? Explain his couplet of song. Interpret 'That's a shealed peascod'
- 43 What is the general character of Goneril's first address to Lear? What does she utterly ignore throughout the speech?
- 44 Show that the fool's 'The hedge-sparrow...young,' is but a continuation, in parable, of what Goneril omitted in her address
- 45 Give both the particular and the universal meaning in 'So out went the candle, and we were left darkling.'
- 46 What caused Lear to ask 'Are you our daughter?'
- 47 Interpret both Lear's and the fool's speeches from 'Does any here know me?' to Goneril's 'This admiration . . .'
- 48 Have you any sympathy with Goneril in the statement of her grievances? Why?
- 49 Is there any difference in Lear's passion here, and in the scene in which he banishes Cordelia?
- 50 Point out the poet's art (from this point to the close of the scene) in engaging the sympathy of the audience for Lear
- 51 How does insanity differ from passion? Note the point at which Lear first exhibits a flash of insanity and explain what causes it
- 52 Lear's appeal to nature is usually called a curse. Is it? If not, what is it?
- 53 How does Goneril receive it? What is the inference?

- 54 Why does the fool take no part in this portion of the scene?
- 55 How does Lear know that 50 of his followers have been dismissed? Show Shakspeare's artistic treatment of this.
- 56 Show the contending emotions of Lear throughout his speech beginning 'I'll tell thee'
- 57 What may we judge of Albany's character from what we see of him in this scene?
- 58 Explain the meaning of the fool's lines just after Lear's exit. What further do they reveal of him?
- 59 For what does the poet prepare us in Goneril's instructions to Oswald?
- 60 Have you yet recognized in Goneril one touch of womanly sympathy or gentleness? If so, what?

Act 1, scene 5

- 1 What is the location of scene 5, and what is its time relation to scene 4? What is the purpose of the scene?
- 2 Compare Lear's instructions to Kent with Goneril's to Oswald. What is the inference?
- 3 Interpret the first two speeches of the fool
- 4 Did he believe Regan would receive Lear kindly?
- 5 Interpret Lear's 'I did her wrong.' What does it reveal of him?
- 6 Show the art of the poet in his treatment of the fool just after this
- 7 Show the change taking place in Lear as evidenced in his last sentences before the gentleman enters
- 8 What quiet touch, full of pathos, does the poet give in closing the scene?

SUMMARY OF ACT 1

- 1 From the standpoint of dramatic technic, what parts of the tragedy are presented in this act?
- 2 Whom may we expect to be the tragic characters as the drama unfolds? Why, in each case?

- 3 If any of these escape the tragic fate, by what agency will they be saved?
- 4 Select from the act 20 quotations applicable to any age and country
- 5 Read the act in class, noting in your study the obsolete words, obscure constructions and literary excellencies, not included in the questions

SUMMARY OF THE PLAY

- 1 Compare Shakspeare's conclusion of the tragedy with that of the Holinshed and *Old Leir* stories. How did Nahum Tate change the Shakspeare tragedy? Why? How long did his version hold the English stage? What great actor restored the original text? In what year?
- 2 Show Shakspeare's art as a poet in making Cordelia, the loving, the virtuous, the angelic, suffer defeat and death
- 3 What great lesson does the poet give us in representing both Lear and Gloster as 'more sinned against than sinning?'
- 4 What lesson does he give us in the defeat and downfall of Edmund, who was the victim of another's sin?
- 5 In portraying a Regan and a Goneril in the one family, as contrasted with an Edmund in the other, what truth does the poet seem to wish to present to us?
- 6 Show how the poet has given us, in this play, the Christian rather than the old Greek or Roman conception of human goodness
- 7 To those who rightly consider this drama, what is the feeling of it? Why? Living the whole of the play over in memory and emotion, what words of the text seem specially to apply to the scene of Lear and Cordelia united in death, and Kent bowing to his master's call?
- 8 Explain how and why it is, that true dramatic art exerts a more powerful influence on humanity than any other art

References

Five lectures on Shakespeare
Lectures on Shakspeare
Shakspeare, his mind and art

Bernhard TenBrink
Samuel Taylor Coleridge
Edward Dowden

Variorum Shakspeare: King Lear	H. H. Furness, ed.
Technique of the drama	Gustav Freytag
Shakespeare commentaries	G. G. Gervinus
Shakspeare's life, art and characters	Henry N. Hudson
Characters of Shakspeare	William Hazlitt
The man and the book	O. M. Ingleby
Shakspeare's heroines	Mrs Anna Jameson
Literary essays	James Russell Lowell
Critical essays on the plays of Shakespeare	W. W. Lloyd
Shakspeare as a dramatic artist	Richard G. Moulton
Shakspearian drama: a commentary: Tragedies	Denton J. Snider
Lectures on dramatic literature	A. W. Schlegel
Shakespeare's dramatic art	Hermann Ulrici
Wit, humor and Shakespeare	John Weiss
Studies in Shakspeare	Richard Grant White

Subj. no. 823

ENGLISH FICTION ^a

Detroit (Mich.) Twentieth century club

1 Introductory

2 *Clarissa Harlowe*.—Samuel Richardson

Points to be noted:

- The epistolary style, introduced by Richardson
- How far are the characters true to life
- Contrast of weakness and strength in *Clarissa's* character
- Lack of growth in characters; a characteristic of Greek drama

Topic suggested: Conscience

3 *Tom Jones*.—Henry Fielding

Points to be noted:

- Fielding 'taught his generation the artistic conduct of a complete plot, combined with realism in characters and events'
- Characters: Contrast Squire Allworthy and Squire Western, the latter 'the type of English country gentleman'
- Total lack of refinement in characters
- Evil characters all accomplished hypocrites
- Fielding as a humorist

Topic suggested: Standard of morality in *Tom Jones*

^aSee also the program of four years work done by the Backworth (Eng.) classical novel-reading union (see Moulton, R: G. *Four years of novel reading*. 1885. p. 23-40).

4 *Roderick Random*.—Tobias George Smollett

Points to be noted:

Compare with *Gil Blas of Lesage*

The book largely autobiographic

Smollett's peculiar satire

Topic suggested: Should characters be constructed as types or as individuals?

5 *Evelina*.—Frances Burney

Points to be noted:

Beginning of a new school: novel of domestic satire

Artistic delineation of character; keenness of insight into character and motives

Refinement of many of the characters as contrasted with the characters of earlier novelists

Topics suggested: Picture of social life of the time

Life of Miss Burney

6 *Bride of Lammermoor*.—Walter Scott

Points to be noted:

The presence of all of Scott's characteristics as a writer; viz, native Scotch character, romance, the supernatural, manly daring

Are the characters of Lucy Ashton and her father self-consistent?

Topic suggested: Can the *Bride of Lammermoor* be seriously analyzed?

7 *Pride and prejudice*.—Jane Austen

Points to be noted:

Elegance of style

The extraordinary vitality of Miss Austen's characters, the more surprising as they are all, or nearly all, commonplace and ordinary people

Her humor

Topic suggested: Character of Elizabeth Bennet

8 *The Newcomes*.—William Thackeray

Points to be noted:

Character of Col. Newcome

Is Thackeray a critic or a great moral satirist?

Compare Thackeray and Fielding

Topic suggested: Thackeray's snobs

9 *Tale of two cities*.—Charles Dickens

Points to be noted:

The author's description of a French mob in this novel contrasted with his description of an English mob in *Barnaby Rudge*

Was the noble self-sacrifice of the hero within the range of human generosity?

Topic suggested: Character of Carton as it develops under the influence of his pure unselfish love

10 *An eye for an eye*.—Anthony Trollope

Points to be noted:

A picture of English manor life. Importance attached to the system of entail

Vivid interest of the story

Does Trollope deserve a place among the great English novelists?

Topic suggested: Trollope's autobiography

11 *Put yourself in his place*.—Charles Reade

Points to be noted:

The interest of character is quite subordinate to that of incident

Was Simmons right to keep silence on his death bed?

The author always writes with a purpose

How far are his characters natural?

Topic suggested: The rights of capitalists

12 *Mill on the Floss*.—George Elliot

Points to be noted:

Was George Elliot the first to show moral development in characters?

The difference between a man's and a woman's devotion
as shown in the mutual attachment of Tom and Maggie
Character sketches of Aunt Glegg and Aunt Pullett
Topic suggested: The humanity of George Eliot

13 *Tess of the D'Urbervilles*.—Thomas Hardy

Points to be noted:

Emotional quality of Hardy's style. His descriptions of
nature

His women

Is Hardy the greatest living novelist?

Topic suggested: Fatalism

14 *The egoist*.—George Meredith

Points to be noted:

Meredith is the Browning of the novel

Is Sir Willoughby Patterne a possible character?

Is there more than one egoist in the book?

Topic suggested: Character of Clara Middleton

Subj. no. 942

EARLY ENGLISH HISTORY

Alpha branch of University extension study club, Ogdensburg
1895-96

- 1 1042 to 1066. Edward the Confessor. Canute. Hardi-
canute. Harold
- 2 1066 to 1087. William the Conqueror. Feudal system.
Curfew bell. The tower. Doomsday book. Lanfranc.
Bayeux tapestry. Battle abbey. Condition of France
- 3 1087 to 1154. William 2. Anselm. Henry 1. Stephen. The
crusades. Chivalry. The white ship. The new forest
- 4 1154 to 1189. Henry 2. Thomas à Becket. Constitutions of
Clarendon. Outlines of Irish history and history of early
Irish church. Trial by jury. Foreign possessions. Rebel-
lions under Henry's sons
- 5 1189 to 1216. Richard 1. Second and third crusades. Magna
charta. Prince Arthur. John and the pope. Slaughter of
Jews

- 6 1216 to 1276. Henry 3. Barons' war. House of commons. Earl of Leicester. Oxford and other universities
- 7 1276 to 1307. Edward 1. Outlines of history of Wales and Scotland. John Baliol. Robert Bruce. William Wallace. Battle of Dunbar
- 8 1307 to 1377. Edward 2. Bannockburn. Queen Isabella. Sieges of castles. Edward 3. Halidon Hill. War with France. Crecy. Calais. Neville's cross. Black Prince. Sir John Mandeville
- 9 Chaucer and his times
- 10 1377 to 1399. Richard 2. Wat Tyler. Peasant revolt. Black death
- 11 Wyclif and the reformation
- 12 1399 to 1422. Henry 4. House of Lancaster. Battle of Shrewsbury. Statute for burning of heretics. Revolt of Wales, of the Percies, of Archbishop Scrope. Prince James. Henry 5. Battle of Agincourt. Treaty of Troyes. Conspiracy of Lollards. Peasant's revolt
- 13 1422 to 1461. Henry 6. Protectorate. Earl of Warwick. Jack Cade. War of the roses. Joan of Arc. Eton and English public schools
- 14 1461 to 1485. Edward 4. House of York. Defeat of Warwick. Edward 5. Duke of Gloster. Richard 3. Murder of princes. Henry Tudor. Bosworth Field. William Caxton
- 15 1485 to 1547. Henry 7. Tudor family. Lambert Simnel. Perkin Warbeck. Discovery of America. Revival of letters. Henry 8. Cardinal Wolsey. Oxford reformers. Erasmus. Thomas More. Henry's wives
- 16 1547 to 1558. Edward 6. Mary, Queen of Scots. Lady Jane Grey. Catholicism. Martyrs. Loss of Calais

Subj. no. 947

RUSSIA⁶*Lansing (Mich.) Woman's club*

- 1 Russian empire: its extent, boundaries, divisions, physical features, climate, rivers, ethnology, location of its chief cities
Russian pronunciation
- 2 Survey of Russian history to 1238 A. D. Romantic stories and sagas; system of appanage; divisions of the country; Kiev
Rise and influence of the Teutonic and Livonian knights
- 3 Russia under the Mongols, 1238-1462: Novogorod, Pskof, Viatka; changes of political center
Russian monasteries: Troitsa and others
- 4 Religion in Russia prior to 1652: origin of the Russian Greek church; Princess (St) Olga; Vladimir (972); results of the introduction of Christianity
Influence of the Tartars on Russia's development
- 5 Moscow and its kremlin; origin; influence, princes, church
Compare Russia with the rest of Europe at the close of the 15th century
- 6 Ivan the Great, 1462-1505: consolidation of the empire; effect of Ivan's marriage on civilization in Russia
The Cossacks—Mazeppa
- 7 Ivan 4, 'The terrible' 1533-84: foreign relations (England, Sweden, Poland); conquest of Siberia; compare the character of Ivan 4 with that of Henry 8 of England
- 8 Conditions of Russia, 1533-1613: political, social and religious—the 'time of trouble'
The Steppes and their inhabitants
- 9 Nikon, the patriarch: his ecclesiastical reforms
Women in Russia

⁶ Selected from a program including English literature and the history of Russia.

- 10 House of Romanof, 1613-82: leading events during the reign of Michael, Alexis, Feodor; character of Sophia, daughter of Alexis

Relations with Europe; influence of the reformation; struggles with Poland; religious controversies

- 11 Peter the Great, 1689-1709: his life to 1709; revolts and other disturbances in the empire; struggle with Charles 12; conquests

- 12 Later years of Peter the Great, 1706-25: various reforms; character as a man; influence of his reign on Russia

- 13 St Petersburg

- 14 Women rulers of Russia, 1725-62: efforts for constitutional government; influence of Germany, of the war with Turkey, of the war of the Austrian succession; revolution; reforms under Elizabeth; French influence

- 15 Catherine 2, 1762-96: her life, policy, partitions of Poland, government, reforms, relations with France, extension of Russian territory

Menshikov, prime minister to Catherine 2

- 16 Paul 1, 1796-1801: alliance with Bonaparte; scheme against India

Finland and the Finns (ceded to Russia 1809)

- 17 Reign of Alexander 1, 1801-25: leading events; foreign affairs
Political career of Bismarck

- 18 Alexander 1, 1805-25: in relation to the internal affairs of Russia

His private life and character; results of his reign

- 19 Serfdom: origin of, conditions, influence on individual development and on national life, changes in form, emancipation

The Icons

- 20 Nicholas 1, 1825-55: how he came to the throne, character of his administration; Polish insurrection (1831); foreign relations

- 21 Poland and Kosciusko
Causes and results of the Crimean war
- 22 Reign of Alexander 2, 1856-81: his reforms; relations with
China, Japan and the United States; circular of Gortchakof
and its effects; character and fate of Alexander 2
Shamil and the Circassians
- 23 Eastern question. Russia in European politics
The Mir and the Zemstov
- 24 Nihilism and nihilists
Russian traits
- 25 Under-ground Russia: mines and mining
- 26 Siberia as a penal colony, and the exile system
- 27 The Jews in Russia
- 28 Russian America
- 29 Russian peasantry
Easter customs in Russia
- 30 Russian language and early literature to 1825; characteristics, folk-lore, songs, poetry; quotations by each member
- 31 Educational system of Russia: universities, present policy of
the empire in regard to education
- 32 Russian art
Verestchagin
- 33 Marriage customs and usages in Russia; the present state of
the Russian family
Newspapers and censorship of the press in Russia
- 34 General Ignatieff, the Russian Gladstone
- 35 Various sects in Russia; attitude of the government toward
them; story of the Pashkoffski
- 36 Character of Russian novels and novelists and their influence
on the Russian people
Comments on a representative novel of Gogol, of Turgenieff,
of Dostoyevski, of Tolstoi
- 37 Russian music, theaters, holidays and amusements
Pushkin
- 38 Imperial administration in Russia

Subj. no. 949.2 STORY OF THE NETHERLANDS

Albion historical club

1895-96

- 1 Physical history of the Netherlands
The ancient Netherlands to the time of Mary of Burgundy
- 2 The people of Holland, their manners and customs
Charles 5 in the Netherlands
- 3 The women whose influence was felt in Holland
Margaret of Parma
Mary of Burgundy
Isabella
Elizabeth
Catherine de Medicis
Anne the governess
- 4 Great Dutch navigators
Dutch East India company
- 5 Phillip 2' and his influence
Famous town halls
Alva: the grand commander and the Spanish inquisition
- 6 William of Nassau, the founder of Dutch liberty
The universities
- 7 The Duke of Parma and the Invincible armada
Church history in the Netherlands
- 8 Amsterdam
Erasmus
Industrial arts
- 9 The Barnevelds
Antwerp
Music of Holland
- 10 Dutch war with England and the administration of John
DeWitt
Literature of Holland
Modern Dutch writers

- 11 Some famous cities of the Netherlands
- 12 Art and artists, Dutch and Flemish
 - Queen Hortense
 - Glimpses of Huguenot history under Henry of Navarre and contemporary events in France from 1670 to end of century
- 13 From the war of 1689 to the treaty of Utrecht
 - Dutch governors of New York
 - Waterloo and its influence in history
- 14 Overthrow of the republic
 - The tulip mania
 - Tapestry weaving and lace making
- 15 Establishment of the monarchy and its history to the present time
 - Institutions of Holland: educational, charitable and reformatory
- 16 As a nation what does America owe to Holland?
 - Brussels
 - Gilds of the Netherlands
- 17 Holland of to-day
 - Motley, his work and influence

References

Holland, 2 v.	Amicis
The land of pluck	Mary Mapes Dodge
John of Barneveld, 2 v.	Motley
Rise of the Dutch republic	Motley
History of the United Netherlands	Motley
Life and letters of Erasmus	Froude
John DeWitt, grand pensionary of Holland, 2 v.	Pontalis
Story of Holland	Rogers
History of the revolt of the Netherlands	von Schiller
Concise history of Holland and Belgium	Young
Young folks history of the Netherlands	Young
Brave little Holland	Griffis
Holland and its people	Amicis
Heart of Holland	Havard
Picturesque Holland	Havard
Sketches in Holland and Scandinavia	Hare
Hans Brinker	Mary Mapes Dodge

By plke and dike	Henty
Phillip II of Spain	Prescott
Reign of Charles V	Prescott
Puritans in England, Holland and America	Campbell
Influence of the Netherlands	Griffis
Reformers before the reformation	Ullman
Woodcutters of Nuremburg	Conway
Comprehensive history of the Netherlands	Butler
History of the Netherlands	Young

Subj. no. 962

MODERN EGYPT

Travelers' club, Olean

GRECO-ROMAN PERIOD

- 1 The Ptolemies
Pilgrimage to Philae
- 2 Cleopatra
Egypt, a Roman province
Discussion: Woman's influence under paganism
- 3 Pagan emperors
The Jews in Egypt
- 4 Reign of Constantine the Great
The Copts

MUSLIM INVASION

- 5 Amrou
Muslim Egyptians: Character and personal characteristics
- 6 Mahomet and Islamism
Festival, return of the pilgrims
Discussion: darweeshes and superstitions
- 7 Egypt under the caliphs
The desert and tent life
- 8 Saladin and the crusaders
Old Cairo
Discussion: Effects of the crusades on Europeans
- 9 The Mamelukes
Education and literature
- 10 Ali Bey
Arabian architecture
Discussion: Domestic life; harem, female dress and ornaments

- 11 Napoleon's campaign in Egypt
Canals

- 12 Obelisks
Boat life on the Nile
Discussion: Modern researches

TURKISH INVASION

- 13 Mehemet Ali
Form of government and military
- 14 Egypt from 1849-63
Industries of Egypt
Discussion: Condition of the Fellaheen
- 15 Ismail Pasha
Court of the Khedive
- 16 The revolt of Arabi
Street life of Cairo
Discussion: The British occupation
- 17 Gordon
Emin Pasha and the Soudan
- 18 Modern Alexandria and Cairo
A winter in Egypt
Discussion: Egypt of to-day

Subj. no. 972

MEXICAN HISTORY

Romeo (Mich.) Monday club

- 1 An introduction to Mexico
- 2 Geography and climate of ancient Mexico
Primitive races
The fabulous Toltec empire
Ruins of Tula
- 3 Quetzalcoatl, or the Fair god
Review: *Fair god*.—Wallace
Mound-builders of Mexico
Cliff dwellers

- 4 Pueblo dwellings
 - The Zunis
 - Tezcucans
 - Government, literature, religion
- 5 The Aztecs and the founding of Tenochtitlan
 - Government, laws and revenues
 - Mexican confederacy and military institutions
 - Educational system
- 6 Manners and customs of the Aztecs
 - Aztec religion
 - Painting and sculpture
 - Language and writing
- 7 Aztec calendar stone
 - Historical sketch to 1502
 - Montezuma 2
 - Floating gardens
- 8 Expeditions of Cordova and Grijalva
 - Life of Hernando Cortez
 - Landing of the Spaniards
 - Dona Marina
- 9 Founding of Vera Cruz
 - Republic of Tlascala
 - Spanish alliance
 - Mexican hand work
- 10 People and city of Cholula
 - Massacre of Cholula
 - The arduous march to Mexico
 - Mexican food and its preparation
- 11 A glimpse of ancient Mexico
 - Capitol, palaces and museums
 - Spaniards in Mexico
 - Mines and mining in Mexico
- 12 Montezuma's arrest and life in the Spanish quarters
 - Difficulty with Narvaez
 - Alvarado's massacre
 - Deposition of Montezuma

- 13 **La noche triste**
Battle of Otumba
Gomara and Bernal Diaz
Fasts and festivals
- 14 **Siege and surrender of Mexico**
Details and effect of the conquest
Rebuilding of the capital
Guatemozin's career
Ecclesiastical power
- 15 **Legend of the patron saint**
Mythology and superstition
Life and work of Las Casas
Historians: Solis; Sahagún
Select readings from Sahagún
- 16 **Palenque and the phantom city**
Ruins of Teotihuacan
Tenenepancos and Nahualac cemeteries
Ruins of Yucatan
- 17 **Viceroy's of the 16th and 17th centuries**
The inquisition
Last viceroys and their struggle for independence
Commercial restrictions
- 18 **Alexander von Humboldt**
Revolution under Miguel Hidalgo
Jose Maria Morelos; Vicente Guerrero
Influence of the clergy
Don Augustin Iturbide
- 19 **Early days of the republic**
Revolt of Texas
Santa Anna
Account of the storming of Monterey
Poem: *Monterey*
- 20 **Battle of Buena Vista**
Poem: *Angels of Buena Vista*
Era of reform

Revolution of Alvarez and Comonfort
Benito Jaures

21 The French invasion

Empire under Maximilian
Brief sketch of Empress Carlotta
Porfirio Diaz
Naturalists in Mexico

22 Modern Mexico

23 Mexico, commercial, social and political
Typical journeys and country life in Mexico
Resources of the country
Art and artists

24 City of Mexico

Cathedrals
Ancient and modern prison system
Popocatepetl
Ode: *Mount Popocatepetl*.—Manuel Carpio

25 Mexican railway system

Mexican army
Important towns
Mexican pottery

26 Mexican missions

Public institutions and schools
Amusements
Boys in Mexico
Poem: *Farewell to Mexico*.—Manuel Acuna

Subj. no. 973.2

YE OLD COLONIE DAYS

Fortnightly, Jamestown

1895-96

FRENCH OCCUPATION

1 Early adventures and explorations: Cartier to Champlain

Native tribes: primeval squaw
What we owe to the Jesuit

Huguenots

LaSalle; the Mississippi

Acadia. 'List to a tale of love'

FRENCH AND INDIAN WAR

2 The red man's rights

Before the coming of Braddock: indian warfare; historic battles

Contention in the Ohio valley

Pitt's campaign

Fall of Quebec: Wolfe; Montcalm

VIRGINIA, 1607

3 Colony planting

Colonial government and social organization: the great charter; house of burgesses

Bacon's rebellion: 'White apron brigade'

Bond servant and slave

Founding of Maryland, 1634

• Church and clergy; aristocracy and democracy

Days and ways in the 'Old dominion'

NIEUW NEDERLANDTS, 1614

4 Character of Dutch institutions and people

'Sea beggars'

Hendrick Hudson

Purchase and settlement of Manhattan: the Walloons

Legends of the Hudson and Mohawk valleys

Dutch governors. Minuit, VanTwiller, Keift, Stuyvesant

NEW YORK, 1664

5 Conquest of New Netherland by the English

Massacre at Schenectady

Dutch colonial manors and manners

Colonial city of New York

'The Jerseys', 1617; Dutch claims

Dutch influence on American institutions

EARLY NEW ENGLAND

Massachusetts, 1620

- 6 Rise of the puritan movement in England under Elizabeth
Pilgrims in Holland and America
Causes for settlement of Massachusetts Bay colony
Pilgrim and puritan
Colonization of New Hampshire, 1623; Connecticut, 1634;
Rhode Island, 1636
The puritan sabbath
Quaint customs and fashions; picturesque incidents and folklore
- 7 New England and its red men; King Philip's war
John Eliot
Religious intolerance
Salem witchcraft: 17th century views of witchcraft and demonology
Boston: royal governors; the old province house
Early New England literature, schools, newspapers
Colonial dames and their husbands

CAROLINA, 1663

- 8 Albemarle and Clarendon colonies
'The grand model'
Wars of extermination
Carolina divided: colonial government; religious liberty
Charleston: growth of commerce; titles and estates
Georgia, 1733: Oglethorpe's scheme of philanthropy
The Wesleys; Whitfield: their attitude to slavery

PENNSYLVANIA, 1682

- 9 Early colonists: Swedes; quakers
William Penn (Minquon); 'the great law'; indian treaty
German immigration; peculiar religious sects
Delaware, 1638; 'the territories'
Colonial Philadelphia
Benjamin Franklin

10 What the French and indian war settled**American commerce****Colonial invitation****Albany congress: Franklin's proposed confederacy****The 13 colonies in 1763****References**

Narrative and critical history of America	Winsor
History of the United States	Bancroft
Popular history of the United States	Bryant
History of the United States	Stephens
Pioneers of France in the New World	Parkman
Jesuits in North America	Parkman
The old régime in Canada	Parkman
Conspiracy of Pontiac	Parkman
Montcalm and Wolfe	Parkman
LaSalle and the discovery of the great west	Parkman
Old times in the colonies	Coffin
Virginia	Cooke
English colonies in America	Doyle
Beginnings of New England	Fiske
Puritan in England, Holland and America	Campbell
History of Pennsylvania	Cornell
History of South Carolina	Sims
Sabbath in puritan New England	Earle
Customs and fashions in Old New England	Earle
Costumes of colonial times	Earle
Rise of the republic	Frothingham
Life of Washington	Irving
American revolution	Fiske
Political history of the United States	Smith
Indian tribes of North America	McKenney
Rise and fall of slave power in America	Wilson
History of American literature	Tyler
Library of American literature	Stedman-Hutchinson

The experience of another year and study of the records of the study club division strongly confirms the opinion previously expressed that this division is destined to reach a much larger constituency and be productive of more practical good than the entire extension lecture course system which many thought to be the whole extension department because of the prominence given

to the lectures in newspaper discussion of the new movement. A successful extension course with a competent lecturer involves a considerable outlay of money, but with the traveling library and other helps afforded by the study club division a very small number of earnest students can at trifling cost carry on a most successful course of study. The 77 subjects in which we now give academic examinations are all open to students who make their preparation in these clubs, and I am confident that the time is near when it will be found wise and practicable to offer examinations and credentials in a number of other subjects oftenest chosen for the work of these study clubs which are springing up all over the state.

The results of the first three years work in this field have been as encouraging as in any work undertaken by the University since I have had the honor to be its executive officer. For this success we are chiefly indebted to the rare ability and fidelity with which the director's assistant, Miss Myrtilla Avery, has done the administrative work.

Respectfully submitted

MELVIL DEWEY

Director

STUDY CLUBS REGISTERED BY

preceding statement

No.	PLACE	Name	Year organized	TIME OF	
				Beginning	Closing
1	Albany	Epworth league, ch. 8891	1895	O	My
2	.....	Unity club	1895	O	Je
3	Albion	Albion historical club	1878	N	Ap
4	.....	Historical conversation club	1878	N	Ap
5	Angelica	Progress club	1894	O	My
6	Attica	Monday club, 1st pres. church	1895	N	Ap
7	Aurora	Thursday club	1895	O	My
8	Belmont	Tourist club	1894	N	My
9	Binghamton	Fortnightly club	1895	N	My
10	.....	Monday afternoon club	1890	O	Je
11	.....	Shakespeare class	1895	O	My
12	Blauvelt	Blauvelt reading circle	1894	O	Ap
13	Boltvar	Sorosis	1895	My	My
14	Brooklyn	Fortnightly club	1893	O	Ap
15	Buffalo	S. S. prim. union: child study club	1892	S	Jl
16	.....	Das Kränzchen	1890	O	Je
17	.....	Graduates' ass'n of Buffalo seminary	1877	N	Ap
18	.....	Highland Park literary club	1892	O	Mr
19	.....	Literary club, Church of the Messiah	1890	N	Mr
20	.....	Monday class	1895	O	Ap
21	.....	Prospect av. baptist ch. literary society	1895	N	Mr
22	.....	Saturday class	1876	N	Ap
23	.....	Buffalo free kindergarten ass'n: train'g class	1891	S	Je
24	.....	Woman's investigating club	1898	O	Ap
25	Camden	Historical club	1890	S	Mr
26	Canastota	Fortnightly club	1895	O	My
27	Canisteo	Shakspeare club	1897	O	My
28	Carthage	Carthage Shakspeare club	1891	O	Ap
29	Catskill	Monday club	1894	D	My
30	Central Valley	Central Valley literary league	1891	S	Je
31	Charlton	Charlton reading circle	1888	O	Ap
32	Cuba	Pleasant hour club	1891	O	Ap
33	Dansville	Oterie	1878	O	My
34	Dunkirk	Cardinal Newman reading circle	1892	S	Je
35	.....	Women's literary club	1895	O	Mr
36	East Randolph	East Randolph hist. and lit. society	1894	S	My
37	Fayetteville	Oterie	1895	S	Je
38	Fillmore	Wide awake club	1896	O	Je
39	Fredonia	Fredonia Shakspeare club	1895	O	Mr
40	.....	Society for study of art	1894	S	Je
41	Fulton	Fulton reading circle	1876	O	Ap
42	.....	Fulton Shakspeare society	1899	O	Ap
43	Geneseo	Monday evening class	1893	S	Je
44	Geneva	Art circle	1893	O	Je
45	.....	Art reading club	1890	O	Jl
46	.....	Travelers club	1895	O	.....
47	Glens Falls	Tuesday club	1896	O	My
48	Gloversville	Every Monday club	1890	N	Mr
49	.....	Monday afternoon study class	1895	N	Mr
50	Greenwich	Y. M. C. A. lyceum and study club	1895	.....	.....

THE UNIVERSITY: STATISTICS 1895-96

means approximately.

MEETINGS		Total no. of papers	Total no. of readings	Subjects of study with number of meetings devoted to each	No.
No.	Frequency				
16	Weekly	10	0	English literature	1
22	Weekly			Critical study of the gospels (33); sociology (10); Amer. literature (14)	2
21	Weekly	23	6	Story of the Netherlands	3
20	Weekly	0	0	Influence of the West on later civilisation of the East	4
16	Biweekly	30	0	English history from the accession of James I through George 4.	5
19	Weekly	0	0	Hamlet (9); Merchant of Venice (7)	6
	Biweekly	17	6	Germany	7
40	Weekly	0	0		8
13	Biweekly	8	12	King Henry 8 (5); Hamlet (7)	9
29	Weekly	0	0	German literature	10
10	Weekly			Shakspeare's historical plays	11
25	Weekly	5	72	American history; American literature	12
22	Weekly	10		American authors; U. S. history	13
15	Biweekly	23	6	Holland	14
54	Weekly			International S. S. primary lesson and related subjects (44); child study (10)	15
25	Biweekly			Sculpture	16
20	Weekly			History of architecture	17
22	Weekly	60	0	Architecture, sculpture and outline history from prehistoric times	18
20	Weekly	30	0	History of Egypt	19
20	Weekly	23	23	Italy	20
21	Weekly	75	0	Europe of to-day	21
25	Weekly	23	0	Greece, its history and literature	22
103	4 days ea. week			Psychology (23); Mutter und Kose-lieder (23); gifts (23); history of education (30); child study (30); nature study (10)	23
22	Weekly	20	0	French literature	24
27	Weekly	53	14	Japan (3); China (5); Amer. lit. (11); India (7)	25
15	Biweekly	14	6	Age of Queen Anne	26
21	Weekly	40	0	German literature (13); lives of great men (5)	27
26	Weekly	13	6	King John (7); Winter's tale (9); King Lear (9)	28
21	Weekly	19		Spanish history	29
25	Semimonthly	10	60	Grecian history (5); Amer. history (3); Age of Elizabeth (2)	30
25	Weekly			English literature	31
22	Weekly	44	3	French history and literature	32
20	Weekly	730	730	16th century of European hist. (34); Russian hist. (6)	33
27	Weekly	23	0	Historical points of controversy (14); church ceremonials (14)	34
20	Weekly	30	0	German hist. & lit. from Frederick the Great to the present time	35
14	Biweekly			Greek and Roman history	36
30	Biweekly	0	20	Holland	37
25	Biweekly			American history (13); civics (10)	38
25	Weekly	0	0	Elisabethan dramatists	39
13	Monthly	733		Architecture and painting	40
25	Weekly			German hist. & lit. during the 18th century	41
15	Biweekly	0		Shakspeare	42
24	Weekly	53	3	Hist. & lit. of Germany (26); current event (3)	43
23	Weekly			Dutch and Flemish art	44
40	Weekly	0	40	English art	45
	Weekly			Germany	46
	Weekly			History of art	47
17	Weekly	17	20	American authors (10); American history (10)	48
23	Weekly	20	20	Early American history to 1846	49
23	Weekly			Colonial history	50

REGISTERED CLUBS

No.	MEMBERS		AVERAGE ATTENDANCE		NO. VOLS. IN		FEES	
	Men	Women	Men	Women	Club library	Traveling library	Entrance	Annual
1	1	12	1	6	.....	102	22	0
2	22	18	.....	.....	0	.....	0	0
3	17	27	9	20	0	.....	75	0
4	12	27	8	18	0	102	0	\$ 50
5	0	22	.....	16	0	.....	0	25
6	12	45	9	25	0	102	0	25
7	0	25	0	14	0	50	0	1
8	0	20	0	16	0	.....	50	50
9	12	17	5	9	0	.....	0	.....
10	0	20	0	15	0	25	0	2
11	0	25	0	15	0	25	0	1
12	7	12	5	8	0	50	0	50
13	0	25	0	14	0	.....	52	.....
14	0	25	0	18	0	.....	0	3
15	0	23	0	60	0	50	0	0
16	0	16	0	12	0	100	0	.....
17	0	200	0	20	0	.....	5	2
18	0	42	0	20	0	120	0	1
19	0	175	0	22	0	100	0	1
20	0	25	0	20	0	.....	0	1
21	9	22	.....	.....	0	.....	0	1
22	0	25	0	19	0	20	0	1
23	0	24	0	.....	0	100	0	25
24	0	72	0	25	0	.....	2	2
25	0	15	0	12	0	.....	0	50
26	8	22	.....	.....	0	.....	0	50
27	0	20	0	15	0	.....	0	.10 monthly
28	0	11	0	8	0	25	0	50
29	0	19	0	17	0	51	0	1
30	21	25	10	20	.....	.....	25	25
31	5	14	4	12	0	104	0	1
32	5	10	4	8	0	46	0	3
33	5	12	.....	.....	.....	.....	0	0
34	1	21	.....	.....	12	55	0	50
35	0	29	0	21	0	104	0	1
36	11	14	.....	.....	0	102	.....	.....
37	0	20	0	17	0	50	0	25
38	0	15	0	12	.....	.....	1	0
39	0	12	0	9	0	59	1	1
40	0	52	0	40	10	50	50	50
41	0	25	0	15	.....	.....	0	.....
42	0	20	0	15	0	.....	0	.....
43	0	18	0	9	0	.....	0	50
44	0	12	.....	0	.....	.....	0	.....
45	0	18	0	12	0	64	3	2
46	2	10	.....	.....	0	52	0	25
47	0	25	0	12	0	25	0	25
48	0	13	0	6	.....	.....	0	0
49	0	20	0	14	.....	.....	0	0
50	.....	.....	.....	.....	.....	25	.....	.....

STATISTICS 1895-96 (continued)

SECRETARY		No.
Name	Address	
Miss E. H. Keays	88 Ten Broeck pl. Albany, N. Y.....	1
Miss L. M. Avann	Albany, N. Y.....	2
Miss A. E. Sears	Albion, N. Y.....	3
Mrs W. G. Swan	Albion, N. Y.....	4
Miss Sophia Atwater	Angelica, N. Y.....	5
Miss F. J. Loomis	Attica, N. Y.....	6
Mrs W. G. Russell	Aurora, N. Y.....	7
Mrs F. B. Keeney	Belvidere, N. Y.....	8
Miss S. S. Clarke	59 Main st. Binghamton, N. Y.....	9
Mrs C. S. Case	240 Front st. Binghamton, N. Y.....	10
Mrs E. C. Sisson	7 Bates pl. Binghamton, N. Y.....	11
Mrs W. G. Kiefe	Blauvelt, N. Y.....	12
Miss M. E. Fisher	Bolivar, N. Y.....	13
Miss J. G. Morris	877 Driggs av. Brooklyn, N. Y.....	14
Mrs F. E. Woods	987 West av. Buffalo, N. Y.....	15
Miss Cora Freeman	263 Jersey st. Buffalo, N. Y.....	16
Mrs W. D. Ward	612 Lafayette av. Buffalo, N. Y.....	17
Mrs Rock Parsons	3194 Main st. Buffalo, N. Y.....	18
Miss Luratie Newman	183 College st. Buffalo, N. Y.....	19
Mrs L. A. Mattice	157 Fargo av. Buffalo, N. Y.....	20
Mrs E. C. Hawks	165 Summer st. Buffalo, N. Y.....	21
Mrs H. R. Howland	217 Summer st. Buffalo, N. Y.....	22
Miss E. C. Elder	86 Delaware av. Buffalo, N. Y.....	23
Mrs J. G. Shuler	454 Ashland av. Buffalo, N. Y.....	24
Mrs E. C. Case	Camden, N. Y.....	25
Miss Josephine Heron	Canastota, N. Y.....	26
Mrs Eva Stephens	Canisteo, N. Y.....	27
Miss F. E. Kellogg	Carthage, N. Y.....	28
Mrs F. H. Osborn	Catskill, N. Y.....	29
J. W. Bush	Central Valley, N. Y.....	30
Miss M. E. Callaghan	Charlton, N. Y.....	31
Miss C. S. Wynkoop	Cuba, N. Y.....	32
Miss L. C. Endress	Danville, N. Y.....	33
Miss Ruth Driggs	490 Central av. Dunkirk, N. Y.....	34
Mrs H. B. Fink	608 Central av. Dunkirk, N. Y.....	35
Maudie E. Weeden	East Randolph, N. Y.....	36
Mrs F. J. House	Fayetteville, N. Y.....	37
Miss E. O. Greene	Fillmore, N. Y.....	38
Miss C. J. White	Fredonia, N. Y.....	39
Mrs Harriet Tiffany	Fredonia, N. Y.....	40
Mrs E. R. Redhead	Fulton, N. Y.....	41
Mrs Robert Phillips	Fulton, N. Y.....	42
Mrs M. W. C. Goodwin	Geneseo, N. Y.....	43
Emma C. Sears	84 Elmwood pl. Geneva, N. Y.....	44
Mrs L. B. Bell	Geneva, N. Y.....	45
Miss Jessie Riley	Genesee st. Geneva, N. Y.....	46
Miss J. A. Leavens	223 Glen st. Glens Falls N. Y.....	47
Mrs E. S. Parkhurst	98 Bleacker st. Gloversville, N. Y.....	48
Mrs A. E. Steele	79 Broad st. Gloversville, N. Y.....	49
Charles P. Miller	Greenwich, N. Y.....	50

REGISTERED CLUBS,

No.	PLACE	Name	Year organized	TIME OF	
				Beginning	Closing
51	Groton	Columbian club	1898	S	Je
52	Hamilton	Hamilton fortnightly club	1894	O	Ap
53	Haverstraw	Nineteenth century club	1898	O	Ap
54	Herkimer	Progressive club	1895	O	Je
55	Hudson	Hendrick Hudson ch. D. A. R.	1895	Ag	Jl
56	Ilion	Historical club	1898	N	My
57	.....	Travelers club	1899	S	My
58	.....	Undenominational missions club	1896	S	Je
59	Jamestown	The Fortnightly	1894	N	Ap
60	Johnstown	Hell	1891	O	Je
61	.....	Round table	1894	O	Ap
62	Littlefalls	Home culture club .....	.....	.....	.....
63	Lockport	Saturday club	1890	N	Ap
64	Massena	Ladies literary club	1898	O	Ap
65	Massena Center	University extension club	1896	O	.....
66	Medina	Fortnightly culture club	1891	O	Ap
67	Middletown	Historical club	1896	O	Jl
68	.....	The Tourists	1899	O	Je
69	.....	Travelers club	1899	O	Je
70	Moravia	Round table	1895	S	Ap
71	Mount Vernon	Emerson club	1895	S	My
72	.....	Westchester woman's club	1894	S	Je
73	New York	Cathedral library reading circle	1899	O	Je
74	.....	Clio club	1898	O	My
75	.....	East side literary society	1894	.....	.....
76	.....	Post parliament	1894	N	Ap
77	.....	Society for political study	1895	O	Ap
78	.....	Society for study of child nature	1890	N	My
79	Nyack	Shakespeare class	1898	Q	Je
80	Oakfield	a Study club .....	.....	.....	.....
81	Ogdensburg	Alpha branch, univ. extension study club	1894	S	Je
82	.....	University extension study club	1894	N	My
83	Olean	Natural science society	1895	Ja	N
84	.....	Travelers club	1894	O	Je
85	Oneida	a Neighborhood club .....	.....	.....	.....
86	Oneonta	Woman's club	1894	O	Je
87	Oxford	Round robin reading club § 16	1895	O	My
88	Phoenix	Shakespeare club	1895	.....	.....
89	Pike	Emersonian reading club	1879	S	Je
90	Portville	Caledonian club	1898	D	Ap
91	Potsdam	Fortnightly club	1899	S	Je
92	Rensselaer co.	Rensselaer co. farmers club	1899	D	N
93	Richmond co.	Woman's club of Richmond co.	1898	O	Je
94	Rochester	Judean club	1895	S	Je
95	.....	Ladies Scottish club	1899	O	My
96	Rome	Current topic club	1898	O	My
97	Salamanca	Olla Podrida	1891	N	Ap
98	.....	Salamanca Balmagundi society	1890	O	Mr
99	Saratoga	Travelers-at-home club	1892	O	My
100	Schenectady	Society to promote useful reading	1877	N	My
101	Schuylerville	Saturday club	1894	Ja	Jl
102	Sherman	East side study club	1890	O	My
103	Silver Creek	Silver Creek study club	1894	S	Ap
104	Syracuse	Azarias reading circle	1894	N	Je
105	.....	Port-folio club	1875	O	Ap

a Discontinued.

STATISTICS 1895-96 (continued)

MEETINGS		Total no. of persons	Total no. of readings	Subjects of study with number of meetings devoted to each	No.
No.	Frequency				
26	Biweekly	14	28	Ancient history (20); Botany (8)	51
15	Biweekly	14	28	Victorian era	52
14	Biweekly	14	28	Germany	53
16	Biweekly	32	64	French hist., lit. & art; current topics	54
17	Monthly	14	28	American history	55
26	Weekly	78	156	English history and literature	56
21	Semimonthly	78	156	French history	57
10	Monthly	30	60	Mission work of the world	58
12	Biweekly	19	38	Ye old colonie days	59
18	Biweekly	19	38	16th century	60
18	Biweekly	57	114	English history	61
12	Biweekly	23	46	Colonial history	62
16	Semimonthly	145	290	Ireland	63
13	Semimonthly	145	290	English authors	64
16	Biweekly	37	74	American literature	65
20	Weekly	60	120	Ancient Egyptian history	66
20	Biweekly	60	120	Holland	67
20	Weekly	60	120	France	68
20	Biweekly	60	120	France	69
20	Biweekly	60	120	France	70
20	Semimonthly	12	24	Emerson	71
20	Semimonthly	12	24	Sociology; hist.; sci.; art; lit.; current topics	72
24	Semimonthly	12	24	Sociology; hist.; sci.; art; lit.; current topics	73
40	Weekly	30	60	American authors	74
40	Weekly	30	60	American authors	75
10	Monthly	23	46	Parliamentary law; Political science	76
24	Weekly	23	46	New constitution of the state of New York	77
20	Weekly	23	46	Child nature	78
35-40	Weekly	20	40	Shakspeare; Dante	79
35-40	Weekly	20	40	Shakspeare; Dante	80
20	Semimonthly	20	40	English history	81
20	Weekly	28	56	England (18); Scotland (8); Ireland (4); Wales (8); Isle of Man (1)	82
8	Monthly	8	16	Science	83
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20	Semimonthly	0	0	Journey through Scotland	95
26	Weekly	26	52	19th century in England & colonial history	96
26	Weekly	26	52	French history and literature	97
26	Weekly	26	52	French history and literature	98
20	Weekly	20	40	Southern France	99
14	Biweekly	10	20	14th century, characters, history, art	100
24	Weekly	0	0	English authors of the 19th century; Shakspeare	101
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REGISTERED CLUBS,

No.	MEMBERS		AVERAGE ATTENDANCE		NO. VOLS. IN		FEES	
	Men	Women	Men	Women	Club library	Traveling library	Entrance	Annual
51	0	20	0	12	0	29	\$1	\$1
52	0	40	0	11	0	50	0	1
53	0	14	0	20	0	68	50	50
54	0	25	0	25	0	45	0	1
55	0	37	0	24	0	50	1	2
56	0	36	0	25	0	50	50	1
57	0	28	0	20	0	108	1	1
58	11	18	10	47	0	50	0	2
59	0	65	0	16	0	50	0	25
60	0	24	0	12	0	65	25	25
61	0	15	0	30	0	100	0	0
62	0	60	0	17	0	100	0	25
63	0	23	0	16	0	25	0	0
64	0	20	0	16	0	0	25	50
65	0	25	0	5	0	0	0	0
66	0	7	0	9	0	46	0	0
67	0	12	0	6	0	0	25	0
68	0	10	0	10	0	50	25	0
69	0	16	0	30	0	124	5	3
70	9	21	4	18	0	25	5	3
71	0	111	0	25	0	51	5	1
72	0	15	0	30	0	50	2	2 50
73	0	50	0	15	0	50	0	0
74	0	125	0	80	0	51	0	50
75	0	235	0	150	0	51	1	1
76	0	35	0	15	0	50	0	0
77	0	30	0	15	0	50	1	1
78	0	30	0	18	0	50	0	0
79	0	30	0	18	0	50	1	1
80	0	186	0	9	0	101	3	5
81	0	15	0	15	0	101	50	variable
82	0	25	0	15	0	101	0	0
83	28	30	0	18	7300	101	0	25
84	0	30	0	18	0	101	25	0
85	0	30	0	18	0	101	0	0
86	0	11	0	7	0	101	0	1
87	15	40	7	25	0	30	0	25
88	125	25	0	50	0	50	25	5
89	0	110	0	20	35	50	25	2
90	50	0	40	25	0	50	0	1
91	0	61	0	30	0	50	1	50
92	0	60	0	15	0	50	1	50
93	0	20	0	15	0	50	0	1
94	8	20	5	12	0	50	0	1
95	0	20	0	30	0	50	0	1
96	0	45	0	30	0	50	0	1
97	0	716	0	5	0	25	0	1
98	0	8	4	5	0	50	0	30
99	6	8	4	15	0	50	0	2
100	7	20	5	24	0	50	0	2
101	0	30	0	24	0	50	0	2
102	0	30	0	24	0	50	0	2
103	0	30	0	24	0	50	0	2
104	0	30	0	24	0	50	0	2
105	0	30	0	24	0	50	0	2

STATISTICS 1895-96 (continued)

SECRETARY		No.
Name	Address	
Mrs E. E. Barney.....	Groton, N. Y.....	51
Mrs W. F. Langworthy.....	Hamilton, N. Y.....	52
Miss I. M. Hedges.....	Haverstraw, N. Y.....	53
Miss E. B. May.....	Palmer house, Herkimer, N. Y.....	54
Miss M. E. Jones.....	512 Union st. Hudson, N. Y.....	55
Miss C. M. Smith.....	Ilion, N. Y.....	56
Miss L. L. Richardson.....	Ilion, N. Y.....	57
Mrs J. C. Truax.....	Ilion, N. Y.....	58
Mrs John Woodward.....	328 E. 4th st. Jamestown, N. Y.....	59
Miss Emma Comrie.....	126 E. Clinton av. Johnstown, N. Y.....	60
Miss Lillie Grimes.....	5 Cady st. Johnstown, N. Y.....	61
Miss Anna Snell.....	Lansing st. Littlefalls, N. Y.....	62
Mrs Wallace Dempsey.....	217 High st. Lockport, N. Y.....	63
Mrs Violet Adams.....	Massena, N. Y.....	64
Mrs Agnes Stearnes.....	Massena Center, N. Y.....	65
Miss L. G. Bowen.....	Medina, N. Y.....	66
Mrs C. C. Luckey.....	Franklin st. Middletown, N. Y.....	67
Miss Lizzie Elmer.....	162 W. Main st. Middletown, N. Y.....	68
Mrs Edward Canfield.....	21 Prospect st. Middletown, N. Y.....	69
Mrs H. J. Fernald.....	Moravia, N. Y.....	70
Miss Emma Robinson.....	419 S. 1st av. Mt Vernon, N. Y.....	71
Mrs J. S. Wood.....	135 S. 2d av. Mt Vernon, N. Y.....	72
Miss E. M. Murphy.....	123 E. 50th st. New York.....	73
Mrs M. L. Gibbs.....	22 E. 126th st. New York.....	74
Clarence Gordon.....	76th st. & East river, New York.....	75
Mrs L. Holbrook.....	128 W. 59th st. New York.....	76
Mrs Minnie Chapin.....	66 Madison av. New York.....	77
Mrs L. Seligsberg.....	1023 Park av. New York.....	78
Mrs Edward Carroll.....	Nyack, N. Y.....	79
Miss Viola Hamilton.....	283 Ford st. Ogdensburg, N. Y.....	80
Miss Harriet Frank.....	64 Greene st. Ogdensburg, N. Y.....	81
J. H. McKee.....	100 Barry st. Olean, N. Y.....	82
Miss E. C. Danforth.....	2d and Sullivan st. Olean, N. Y.....	83
Miss E. A. Curtis.....	339 Main st. Oneonta, N. Y.....	84
Miss H. M. Van Wagenen.....	Oxford, N. Y.....	85
Mary Gleason.....	Phoenix, N. Y.....	86
Mrs C. B. Ryder.....	Pike, N. Y.....	87
Mrs E. A. H. Barnes.....	Portville, N. Y.....	88
Mrs T. B. Stowell.....	Potdam, N. Y.....	89
O. J. Lewis.....	Schodack Center, N. Y.....	90
Mrs C. W. Townsend.....	New Brighton, S. I., N. Y.....	91
Philip Manson.....	Rochester, N. Y.....	92
Miss Carrie Frazier.....	19 Amherst st. Rochester, N. Y.....	93
Miss Anna Champion.....	Rome, N. Y.....	94
Mrs Jennie Swan.....	Salamanca, N. Y.....	95
Miss Dora Brown.....	Salamanca, N. Y.....	96
Mrs L. A. James.....	Saratoga Springs, N. Y.....	97
Mrs Alice Wells.....	College Terrace, Schenectady, N. Y.....	98
Miss E. C. Carpenter.....	Schuyterville, N. Y.....	99
Mrs J. G. Bly.....	Sherman, N. Y.....	100
Miss Etta Montgomery.....	Silver Creek, N. Y.....	101
Miss Catherine Dunn.....	700 Bear st. Syracuse, N. Y.....	102
Miss M. S. Morse.....	607 W. Genesee st. Syracuse, N. Y.....	103

REGISTERED CLUBS.

No.	PLACE	Name	Year organized	TIME OF	
				Beginning	Closing
106	.....	α Shakespeare univ. exten. study club.....	1886	.....	.....
107	.....	Wednesday club.....	1887	O	My
108	Troy.....	East side study class	1889	O	Je
109	.....	Ford league	1895	N	.....
110	.....	Method class	1895	W	.....
111	.....	Rural reading club.....	1896	Jl	N
112	Utica	New century club	1898	B	Je
113	Warsaw	Addisonian club	1897	B	Je
114	.....	Monday club.....	1890	O	Ap
115	Watertown.....	Current topics club.....	1894	N	.....
116	.....	Watertown literary club.....	1895	N	Je
117	.....	Wednesday morning art class.....	1892	O	Je
118	Waterville	Every Saturday night club	1886	O	My
119	.....	Home study circle	1895	O	My
120	.....	Travelers club	1898	O	My
121	Wellsville	Monday club.....	.....	O	My
122	West New Brighton..	Easy chair reading circle.....	1895	.....	.....
123	Westfield	Monday evening club	1888	O	My
124	Worcester	Fortightly club	1890	O	My
125	Yonkers	Civic league of Woman's institute.....	1895	O	Je

α Discontinued.

STATISTICS 1895-96 (concluded)

MEETINGS		Total no. of persons	Total no. of readings	Subjects of study with number of meetings devoted to each	No.
No.	Frequency				
20	Biweekly	18		French history to the time of Louis 15	106
18	Biweekly	24	40	Ruskin as an art critic (4); study of Venice (6); Florence (8)	107
				Ancient history; Amer. statesmen	108
	Weekly			Pedagogic methods	109
32	Weekly			Agriculture	110
22	Weekly	75		American government	111
17	Biweekly	30	9	American history; current topics	112
29	Weekly	39	1	History of France in 19th century	113
16	Biweekly			Travel through England	114
40	Weekly	0	0	English and continental literature	115
16	Biweekly			Architecture	116
23	Weekly			Roman history	117
23	Weekly	12	23	Early history of the Britons	118
30	Weekly			Travel in England	119
57	Weekly	44	5	Geology; civics	120
22	Weekly	0		Spain and Holland	121
29	Weekly	52	29	French literature to 1880; social questions	122
31	Weekly	4	10	American literature	123
17	Irregularly	4		Constitutional government	124

REGISTERED CLUBS.

No.	MEMBERS		AVERAGE ATTENDANCE		NO. VOLS. IN		FEES	
	Men	Women	Men	Women	Club Library	Traveling Library	Entrance	Annual
106								
107	0	30	0	25	0	53	\$1	\$1
108	0	12	0	9	0	25	0	25
109	40				0	100	25	2
110	0	5						
111	7	3	7	3	0		0	0
112	0	250	0	100		101	0	10
113	12	22	5	13	0		0	50
114	0	90	0	38	0	100	1	1
115	0	16	0	10	0	50	0	50
116	3	5	2	5	0	100	0	1
117	0	21	0	15	0	100	1	
118	0	16	0	12	0	25	50	50
119	0	14	0	14	0		50	50
120	0	29	0	12		25	50	50
121	0	42	0	20	232		1	50
122	0	12	0	79	0	25	0	Variable
123	0	50	0	35	0	100	0	1
124	0	18	0	15	0		25	25
125	0	74	0	25	0		0	1

STATISTICS 1895-96 (concluded)

SECRETARY		No.
Name	Address	
Mrs Nicholas Peters	908 N. Alvord st. Syracuse, N. Y.	106
Miss C. E. Harrison	Linden av. Troy, N. Y.	107
W. J. Granger	55 4th st. Troy, N. Y.	108
Miss E. H. Angell	83 2d st. Troy, N. Y.	109
J. J. Brodie	811 3d st. Troy, N. Y.	110
Mrs M. A. Mitchell	253 Genesee st. Utica, N. Y.	111
Mr Herbert Wadsworth	Warsaw, N. Y.	112
Miss Evelyn Parke	Warsaw, N. Y.	113
Miss F. G. Olin	Stone st. Watertown, N. Y.	114
A. B. Thompson	Watertown, N. Y.	115
Mrs G. S. Knowlton	61 Washington st. Watertown, N. Y.	116
Mrs C. B. Peck	Waterville, N. Y.	117
Mrs A. C. Clarke	Waterville, N. Y.	118
Miss Katherine Livermore	Waterville, N. Y.	119
Miss B. F. Cummings	Wellsville, N. Y.	120
Miss A. E. Simonson	West New Brighton, N. Y.	121
Miss A. E. Holt	Westfield, N. Y.	122
Mrs G. B. Crippen	Worcester, N. Y.	123
Mrs William Sharman	150 Woodworth av. Yonkers, N. Y.	124
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Extension Bulletin

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REPORT OF EXTENSION TEACHING DIVISION, 1896

To the regents of the University of the State of New York

I have the honor to report as follows for the year ending September 30, 1896:

REGENTS CENTERS

After five years of organization the New York extension department finds a constantly enlarging field of activity and a growing appreciation of the kind of work it is attempting to do. Extension teaching, with which the department was at first confused by many who thought this to be the entire field, is in fact only one division of the department, coordinate with the important work of the library, study club and summer school divisions which are reported in separate bulletins. While the financial outlay necessary for extension teaching has in some cases made an apparent shrinkage in results accomplished at local centers, it will be found on examination that interest and effort have rarely abated but have been directed toward establishing local libraries, aiding and engaging in the study of local clubs or in organizing and stimulating other phases of home education more easily obtainable than local lectures in this period of limited financial ability. While the department deplores the necessity for the abandonment at some centers of plans for extension teaching, the substitutes adopted by such centers have been encouraged and helped in every way possible, both for the sake of advancing the definite phase of work chosen and also of laying plans which when matured will directly aid in establishing the local lecture system on a permanent basis.

During the past year 17 centers were actively engaged in extension teaching. Three new centers were registered at White Plains, Kingston, and at the Teachers college, New York. At the latter center courses have been given since 1889. Of

the 54 courses given during the year 27 were given at Teachers college on topics allied to the subjects taught in the regular course; of the remaining 27 courses, eight were on literature, six on science, three each on history and fine arts, two on economics, one each on pedagogy, civics, English language, leaders of political thought, India and Persia.

A summary of the work of the year is shown in the following table of statistics:

Statistics of regents centers 1896

Centers	Subject	Lecturer	No. of lectures	AVERAGE ATTENDANCE AT		Total no. of papers written	CANDIDATES		
				Lectures	Class		Examined	Passed	Passed with honor
Albany	History and criticism of painting	W. H. Goodyear ..	10	450	25	19	2	2	2
Buffalo (Y. M. C. A.)	Civil and religious liberty in America	C. E. Fitch	10	146	31	68	8	7	2
	English literature	J. H. Gilmore	10	179	...	28	14	11	4
Gloversville	Civics (class course)	.....	.....	.....	8	.....	.....	.....	.....
	Economics	.....	.....	.....	40	.....	.....	.....	.....
Kingston	Labor problem	H. E. Mills	10	89	51	10	.....	.....	.....
Lowville	English literature	.....	.....	.....	10	.....	.....	.....	.....
	Fine arts	.....	.....	.....	10	.....	.....	.....	.....
	Science	.....	.....	.....	10	.....	.....	.....	.....
Mt Vernon	Shakespeare	A. V. W. Jackson ..	4	100	.....	10	.....	.....	.....
	Ancient India and Persia	A. V. W. Jackson ..	6	77	.....	.....	.....	.....	.....
	Chemistry	P. T. Ansten	12	118	.....	.....	.....	.....	.....
New York (American institute)	Electric engineering	Specialists	20	50	20	1154	22	22	9
Teachers college ..	Art	.....	.....	.....	.....	.....	.....	.....	.....
	Domestic science	.....	.....	.....	.....	.....	.....	.....	.....
	Drawing	.....	.....	.....	.....	.....	.....	.....	.....
	Geology	.....	.....	.....	.....	.....	.....	.....	.....
	Kindergarten	.....	240	150	15	.....	.....	.....	.....
	Manual training	.....	.....	.....	.....	.....	.....	.....	.....
	Methods	.....	.....	.....	.....	.....	.....	.....	.....
	Physics	.....	.....	.....	.....	.....	.....	.....	.....
Rochester	The England of the American revolution	T. H. Pattison	10	345	255	14	3	3	1
	Shakespeare	J. H. Gilmore	10	576	415	16	2	2	1
	Physiology and anatomy	H. E. Webster	10	53	86	.....	.....	.....	.....
	Elements of pedagogics	G. M. Forbes	10	290	243	60	5	5	3
	Development of music	P. D. Aldrich	10	239	136	7	.....	.....	.....
Salem	American literature in the colonial period	J. R. Truax	10	46	12	11	.....	.....	.....
Saratoga	America and Europe in the 18th century	R. A. Rice	10	116	.....	.....	.....	.....	.....
Sing Sing	Masterpieces of English literature	A. V. W. Jackson ..	10	160	158	34	6	6	2
Syracuse	Julius Caesar	Mrs J. K. Curtis ..	10	80	.....	140	16	16	7
Tarrytown	Leaders of political thought	Woodrow Wilson ..	6	120	.....	.....	.....	.....	.....
Utica	Electricity up to date	G. C. Hodges	10	93	47	10	.....	.....	.....
White Plains	English language and literature	A. V. W. Jackson ..	10	85	35	.....	2	1	1
Yonkers	Zoologic geography	W. B. Scott	10	111	10	.....	.....	.....	.....
	English literature	A. V. W. Jackson ..	6	195	27	.....	4	4	4

a 9 took examinations given by Teachers college,

In order to test the progress of the last five years at local centers, a series of questions was sent to each local secretary^a. Responses were received from 22 centers. Of these Albany, Yonkers, Rochester and Skaneateles were registered the first year; Batavia, Peekskill, Tarrytown, Salem, Hornellsville, Owego, Rome and Buffalo the second year; Mount Vernon, Waverly, Dobbs Ferry and Oneida the third year; Lowville, Buffalo Y. M. C. A., Geneva and Sing Sing the fourth year; White Plains and Kingston the fifth year. The returns from each center have been summarized and with some farther comments are here published, the active centers being grouped together in alphabetic order in the pages immediately following.

Albany. The Albany center continues to be vigorously supported, partly because of the interest of its managers and largely because there is a real demand from residents for the extension courses. The executive committee at present consists of: Harlan P. French, Rev. W: M. Brundage, D. D., Thomas F. O'Brien, George W. Stedman, H. J. Ackroyd. With the exception of Mr G: W. Stedman, the former secretary, none of these officers served at the time of the center's organization but the management of the center was transferred to other workers so gradually and skilfully that the work itself has not suffered.

Buffalo. The Buffalo Y. M. C. A. center began its work five years ago though it was not registered till 1894. The officers are: R. B. Adam, chairman, W: F. Hirsch, secretary. The work seems to be thoroughly appreciated though the secretary reports that great labor is needed to sell tickets enough to meet financial obligations. The center is fortunate in having a president willing to testify to his belief in the benefits of university extension by personally assuming a deficit if one occurs.

Gloversville. The Gloversville center was organized and has been fostered and maintained through the untiring energy of the public librarian, Mr A. L. Peck. Funds have never been avail-

^a These questions will be found printed in full with the answers sent in by the Geneva center, on p. 301.

able for the full lecture course by an outside teacher and Mr Peck has therefore personally conducted class courses each year on two or more subjects, taking as his guide syllabuses prepared by extension teachers and printed by the University.

Three registered study clubs are one of the results of the center's work. There is also a literary society among the pupils of the high school which meets regularly at the library with an average attendance of 40. Papers are prepared and debates on historical and economic subjects are carried on. The library provides all the books and helps for these meetings. This close relation between the extension center and the public library can not be too strongly commended and as soon as the plans of the librarian can be carried out, for securing a specialist each year to conduct the work of teaching, Gloversville should take a front rank among extension centers of the country.

Kingston. Only one course has been given at Kingston, which was well attended and in every way satisfactory, but the price of the course tickets was placed too low and a deficit resulted which somewhat discouraged the managers. If the financial difficulty can be adjusted the center will without doubt become well established for a good degree of interest in extension work was manifested. The officers are Sup't of schools M. J. Michael, president, John W. Searing, secretary.

Lowville. The organization of the Lowville center grew out of a desire of a few, for some associated and systematic educational discipline for those no longer in school. Extension teaching was chosen on trial, but it was found that a single course of lectures, which was all the center could afford each year, did not accomplish the results desired, and did not hold together a band of students which could be rallied. After much deliberation, therefore, the center was organized into four departments: literature, science, history and fine arts.

The literature department is also divided into five sections: 1) Reading, 2) Criticism, 3) Rhetorical, 4) Introductory, 5) Occasional. The first section will cover the reading course as outlined

in the Regents academic syllabus on p. 308. The critical work will include the study and practice given in the syllabus on p. 309; for rhetorical work, a selection of a popular subject is made; in the Introductory section, the history of English literature is followed and works of current interest will be reviewed in the Occasional section.

The science department will include astronomy, meteorology, electricity, dynamics and mechanics, geology, botany, zoology and biology. The history department will include economics and government, and the fine arts department will cover architecture, sculpture, painting, music and oratory.

These departments have been under one direction, with leaders who act as teachers or lecturers. A traveling library is supplied for each subject and the reading of students is carefully directed. The didactic method is used, papers must be written by each member and discussions, quizzes and reviews make up the regular work. Good results are reported in three of the departments; the courses planned for the history department had to be abandoned because of the illness of the leader. The president of the center, Rev. J. Westby Earnshaw, reports that the value of the courses educationally is already great, with the promise of still more encouraging results as the work becomes better understood.

Mount Vernon. Extension teaching at Mount Vernon is under direction of a board of managers of which Edward Gay is president and Rev. Frank L. Maseck, secretary and treasurer. General interest is shown in the lectures and as the new public library under management of Miss Helen K. Gay, a recent student of the New York state library school, becomes a factor in the educational life of the city, it is expected that the center will become a recognized and permanent institution supplying systematic instruction to its students and offering opportunities for culture to others who are glad to combine with entertainment some intellectual benefit.

New York, Teachers college. The Teachers college of New York city has since 1889 engaged in extension work, mainly for

the benefit of teachers in public and private schools of the city. This work is varied and appears in almost all the forms recognized by the extension department. There are Saturday afternoon and evening classes, parents meetings, free public lectures and a summer school, all using freely the laboratories and apparatus of the Teachers college and specially the Bryson library of 8000 volumes.

The Saturday classes are designed specially to meet the needs of the following groups:

- 1 Principals and superintendents of schools, both public and private. To such the Teachers college cordially opens its doors, inviting them to attend any course or visit all courses without charge, excepting only the laboratory work in manual training.

- 2 Specialists and general teachers in secondary schools, both public and private, high and normal schools, academies and fitting schools. Many teachers, particularly specialists in manual training and elementary form drawing and color, have been enabled successfully to carry on their work with no other professional training than that received in the Saturday classes.

- 3 Teachers in public schools. These have found the Saturday classes not only helpful in their classroom work but often sufficient to prepare them for professional examinations for promotion.

- 4 College graduates desiring to pursue graduate studies in pedagogics, sometimes as candidates for higher degrees under the arrangement with Columbia university and Barnard college.

- 5 Parents who desire to make an intelligent study of the problems in which both teachers and parents are interested.

The afternoon and evening courses are for any interested but the greater proportion in attendance are teachers. In some subjects tickets are not required for admission. At one course of lectures during 1895-96, 250 persons were registered as regular attendants, four fifths of whom were teachers.

The parents meetings include general conferences and lectures on topics relating to the child, his need, training and relation to school and home.

Besides these regular classes many free public lectures are given on educational subjects open to any interested. Notices of such lectures will be sent regularly on sending name and address to the registrar. The general attendance at lectures is excellent in consideration of the present location of the center in a somewhat sparsely settled district. As the northwestern section of the city is built up, an increase of numbers in attendance may be expected.

Another phase of extension work in which Teachers college is engaged is the summer school of manual training and art education, opened in 1896, reports of which will appear in our annual bulletin on summer schools.

In his report for 1895-96 the president of the Teachers college calls attention to two other matters of special interest and promise to extension workers. The first is the appointment of a committee including representative workers in domestic science to investigate and advance this study. The president of Teachers college is chairman of the committee and the results of the investigations will be published in the Teachers college bulletin. The second matter is the growing appreciation of the need of training for Sunday school teachers. One evidence of this is the formation of a league of 40 churches situated north of the Harlem river, representing all denominations, which has asked the Teachers college to provide a course of lectures on Sunday school work in the light of modern pedagogy. President Hervey gives the matter his personal attention believing it to be an important step toward the application of sound methods and principles to Sunday school teaching.

Rochester. Extension courses in Rochester are generally recognized as a permanent educational institution of the city, for the benefit of busy people with little time for study.

The librarians say that by far the greatest amount of systematic reading among regular visitors at the libraries is done by extension students. The secretary, Mr J. E. Whitney, has carried most of the work and is responsible for the excellent record which the center has made.

Salem. The Salem center is supported mainly for culture and enjoyment by the literary element of the population. The traveling library is well used, not so much for study as for general reading directed, by interest in the course of lectures in progress, to subjects covered by these books. To this center made up of cultivated people distant from the advantages of the larger towns university extension gives a much needed and appreciated impetus to wider reading and thought, under direction of a competent leader, and the members are brought into contact with a specialist whose opportunity it is to stimulate and direct the vigorous intellectual growth which the quiet life of an inland town makes possible.

The officers are: President, Abner Robertson; secretary, Antoinette Lambert; treasurer, John Walsh.

Silver Lake assembly. This center was registered before our summer school division was fully organized and is therefore reported in both places. The president Rev. Ward Platt writes that the demand for extension work among the summer school students is not great enough to justify giving as much prominence to extension courses as the managers would like. Miscellaneous lectures and concerts constitute therefore the larger part of the program but courses in language, business methods, art, etc. are conducted by the Genesee Wesleyan seminary which holds a summer session on the assembly grounds. Excellent opportunities are also offered in music and physical training.

The assembly program for 1895 included a week of university extension lectures under the auspices of Syracuse university. The following courses were given: physics (five lectures) by Prof. W. H. Jakway; political economy (five lectures) by Prof. Delmer E. Hawkins; Roman history (four lectures) by Prof. Frank Smalley; science (three lectures) by Dr Charles W. Hargitt.

Sing Sing. The Ossining center at Sing Sing was organized last year after a careful canvas of the subject, with the following officers: President, H: B. Holbrook, vice-president, Dr E. B. Sherwood, secretary, Anna Underhill, treasurer, Frank L. Young.

The center met with a disappointment at the outset, in the death of Prof. H. H. Boyesen of Columbia university, who was engaged some months in advance for the first course. Through the energy of the officers, however, arrangements for another course were completed in less than a week, with Prof. A. V. Williams Jackson also of Columbia who was the more willing to undertake the work because of his personal friendship for Prof. Boyesen. The center is well managed, the officers planning for courses early and so providing against demoralizing uncertainties and delays.

Syracuse. The Syracuse center grew out of a course on Shakspeare undertaken by the Portfolio club, under the leadership of Mrs Jessie K. Curtis. The advantages of such study attracted others and it was decided to throw the lectures open to those outside the club. As now organized the work consists of class courses lasting during the year, each class being limited to 30 members. Two plays are usually studied each year, a syllabus for the work being prepared by Mrs Curtis and printed by the University. As study is essential to the success of the work, the members are expected to prepare for each meeting not only by general reading but by looking up the answers to a series of questions suggested in the syllabus of each lecture.

At the close of the year's work last spring Dr Rolfe gave a lecture to the students and others interested and a similar yearly lecture by some specialist in Shaksperian study is planned. It is reported in the town that 'Shakspeare has almost driven out whist.'

The president of the center is Mr E. H. Barrett and the treasurer is Mrs Edward Wright. The sections also have officers. One practical result has been the organization of a Shakspeare club at Baldwinsville, following the Syracuse plan.

Tarrytown. Lecture courses on the extension plan have been carried on in Tarrytown since 1892 but the organization has been incomplete and dependent on two or three individuals. In April, 1896, through the efforts of the president, Miss Margaret Prall Grant, a public meeting was arranged and was addressed by

Sec. Melvil Dewey of the University. At this meeting a permanent organization was effected and the following officers elected: President, Dr Carroll Dunham, Irvington; first vice-president, C. H. Curtis, Tarrytown; second vice-president, George E. Adams, Tarrytown; secretary, Miss Margaret Prall Grant, Tarrytown; treasurer, Miss Ella Lowe, Tarrytown.

While the results of the work are not easy to trace, the people of Tarrytown feel that through the lectures interest in educational subjects has been quickened and intellectual life stimulated. As a social element in bringing into working relations people of different churches and pursuits the beneficial results of the extension movement have been particularly apparent.

White Plains. The White Plains center has for two winters had half courses but the managers expect to adopt the 10 lecture course as soon as interest will justify the additional financial outlay. The officers of the center are: President, H. Ernest Schmid, M. D.; secretary, Ralph A. Stewart; treasurer, Newton F. Curtis, M. D.

The movement has not yet made sufficient progress to allow an intelligent statement as to results, the managers finding that the first work necessary is to awaken a desire on the part of the townspeople for consecutive lectures intended for education rather than amusement.

Yonkers. The Yonkers society for university extension grew out of a resolution offered at a meeting of the Y. M. C. A. Later a public meeting was called and was attended by representative citizens of Yonkers who became actively interested in the cause. The center is well organized and its finances are on a sound basis. The present officers are: President, A. V. Williams Jackson; first vice-president, Norton P. Otis; second vice-president, John Kendrick Bangs; secretary, J. Harvey Bell; treasurer, F. W. R. Eschmann.

Committees are appointed on students clubs, membership and finance, entertainment and auditing. The very flourishing condition of the center is largely due to the active interest of its

president, Prof. A. V. Williams Jackson of Columbia, who at great cost of time and labor has conducted special classes, encouraged students both in conversation and by letter to do the class and paper work and take the examinations and by his own ardent belief in the possibilities of well directed extension work has kept interest and enthusiasm alive among members of the center. The comments of the press and the opinions of citizens generally expressed as to the results of extension teaching in Yonkers indicate that the work there is gaining a firm foothold.

Of the 29 centers reporting, 14 stated that extension work had been discontinued. Three, Hornellsville, Skaneateles and Peekskill had only one course each, and while extension methods were followed at both centers the work was looked upon rather as a lecture course, and was not sufficiently well organized to be permanent.

Peekskill. One of the causes of the discontinuance of extension work at Peekskill was the removal from town of the local secretary. Reorganization will, however, doubtless be effected here as several citizens have separately expressed their desire for more extension courses. If resumed the work will probably be associated with the public school authorities.

Geneva. The blank returned from Geneva presents so humorous a view of a sad condition that it is here reprinted showing the questions which were sent to each center and the answers given in the unsigned report returned from Geneva by an extension pessimist. Perhaps this return, unique in its discouragement, may be as useful as a warning as are others because of their encouragement.

EXTENSION TEACHING DIVISION

Name of center.	<i>Geneva.</i>	;
Year organized.	<i>1895.</i>	
Number of 10-lecture courses.	<i>One.</i>	
Number of other lectures.	<i>None.</i>	

How many short courses of less than 10 lectures have you had?
None.

What is your opinion as to their value? *None.*

How many full courses do you intend to have each year?
Can not say.

Is there a demand for extension courses among your residents, or is it necessary to rouse interest in each course separately?
Necessary to arouse interest and hard to do it, too.

What subjects have been most popular? *None.*

Have the lectures been attended mainly for entertainment or for study? *Not for study.*

How many members has your center? *About 70.*

What is the average attendance at lectures? *50.* At classes? *None.*

How many write papers? *None.*

How many take the examination? *None.*

Have your courses aimed at sequence in studies? *Undoubtedly they have aimed at it.*

Are auditors admitted to your classes, or do you restrict class attendance to students? *Auditors welcomed.*

Do you have a class both before and after the lecture?
Neither before nor after.

If so, what is the plan for each? *None.*

How do your officers aid the lecturer in managing class work?
Not at all.

What methods have you used to induce students to write papers and take the examination? *Persuasion, eloquence; everything but force.*

What is your opinion as to the educational value of extension courses in your town? *I have no opinion.*

Is there a public library in your town? *No.*

If so, does it make special provision for extension students?

Has your center a library of its own? *No.* If so, how many volumes does it contain?

Are the traveling libraries used by students in preparation for papers, or for general reading? *For neither object.*

Have you made any effort to reach the workingmen? *No.*

If so, with what success?

What class of people mainly have attended your extension courses? *School teachers.*

Have many of them hitherto had educational advantages beyond the elementary-school course? *All or nearly all, I think.*

What methods have you found most successful in securing funds? *The severest methods.*

What is the price of course tickets? *\$2.*

Do you sell tickets for single lectures? *Yes.*

If so, at what price? *25 cents.*

To what extent and in what way do you advertise? *Town papers and bulletin.*

Is the work well organized, or is its success dependent on the efforts of a few? *On efforts of a very few.*

Does your managing board include representatives of all classes, sects and parties? *It tries to.*

Do the educational clubs of your town cooperate with the extension center? *There are no such clubs.*

If so, how?

Is there direct and well defined connection between the center and the public school teachers? *Yes.*

Do you allow children of school age to attend the courses? *Yes.*

In what ways can the Extension department be more helpful to you? *None, the case is hopeless.*

If your center has been unsuccessful, please give causes. *The people will not give enough money to get an out-of-town lecturer here and most of the Hobart faculty will not lecture.*

If it has been discontinued, would reorganization be practicable? *It has not been discontinued; it sleeps. Perhaps it can be rejuvenated. I doubt it.*

If so, please give names and addresses of those who would be willing to undertake the work of reorganization.

Has any other organization, such as a club, institute or summer school grown out of your center? *None.*

If so, with what success?

Please give a brief history (not more than 200 words) of extension work in your town, including names and addresses of your officers, with any farther suggestions or remarks that you may wish to add.

The work has all been done by a few Y. M. C. A. men with a few from the high school and college. But the center ought never to have been chartered, as it never had money enough in view to hire an out-of-town lecturer. So, after one course of lectures by a man in town, it slept. It still sleeps; that is its history.

Five centers, Batavia, Dobbs Ferry, Owego, Saratoga and Waverly, carried their organization through more than one year, but the same lack of permanent organization and of a sufficiently strong demand for extension teaching instead of popular lectures, has resulted in discontinuing the work.

Dobbs Ferry. At this center, auditors went to the lectures for entertainment and now find this object attained better by lecture courses and concerts than by the more serious extension methods. The proximity of this center to New York also makes the need for such teaching less urgent than in towns and villages farther removed from universities and other educational advantages of a great city. In addition to these difficulties, Mr Norman Wilde, who was most interested in the center, was compelled by new duties to give up his active efforts to establish the work firmly; later, others interested left town and the course was abandoned.

Owego. In Owego the work seems to have been left to a few, whose efforts were necessarily concentrated mainly on the financial support of the lectures. The course being avowedly for entertainment, the officers did nothing to aid the lecturer in managing class work nor to induce auditors to become students. The report states that the extension courses were 'of great value to those who availed themselves of them', but apparently no attempt was made to bring the benefits of extension teaching to

those who from their ignorance of such work and its results, particularly needed it. Here again the lyceum course satisfied the intention of the managers better than an extension course.

Waverly. The Y. M. C. A. has the field with popular courses and as the organization is just starting, the former leaders of extension teaching do not wish to hurt the Y. M. C. A. lectures by conducting rival courses.

Two centers, Buffalo and Oneida, gave up extension work after maintaining three courses in sequence.

Buffalo. The three courses at the Buffalo center were in connection with the society of natural sciences and constituted a sequence on electricity given before a center made up of practical electricians. A factor in the waning interest which brought the lectures to a close after the third course, was the refusal by the University to give academic credit for credentials won at examinations.

Oneida. At Oneida three courses also in sequence were given. The managers recognized the educational value of the work and put forth well directed and effective efforts to make the courses educational and financially successful. Questions were asked of the lecturer at class and while paper work was not sufficiently encouraged to become a prominent part of each course the intellectual level of the town was perceptibly raised by the work of the center and more serious subjects became the topics of conversation. The real difficulty lay in the lack of any suitable hall in which to hold the lectures, the opera house being the only room large enough to hold a sufficient number of auditors to make the courses financially possible. Though this was used for each course, it was too expensive to be engaged in advance for 10 evenings and consequently the date of each lecture had to be positively announced a few days in advance, and sometimes changes occurred almost at the last moment as a more profitable

rental presented itself to the opera house managers. Even with this inconvenience, also, the expense of renting the opera house was too great. Some churches of the town would willingly have offered their auditoriums but the various religious affiliations of different members, it was feared, made this impracticable. A contemplated Y. M. C. A. building with suitable lecture and class rooms will presumably furnish a home to the extension center and so give the movement the success the efforts of its managers deserve.

Rome. At Rome the center has been only temporarily discontinued, owing to financial difficulties. During the first year the work was highly successful partly on account of its novelty and partly because of the popularity of the lecturer. The low price of tickets (\$1 for 10 lectures) brought it within reach of all, and many not naturally interested bought tickets at the solicitation of friends. After the first year this class however could not be relied on and the low price of tickets crippled the center financially. In the reorganization of the center, an important change will be a sufficient increase in the price of course tickets to meet expenses.

Three centers which up to this time have maintained extension work with success now report that the work is to be abandoned. These are the American institute, New York, Saratoga and Utica. A report of each follows.

New York. The center at the American institute was first established under the auspices of Columbia college and the lectures were held at Cooper union. The subject of study selected was electricity and about 250 electrical workers were in attendance at the first course. Mr W. H. Freedman, a tutor at Columbia, was in charge of the work as class conductor, but the lectures were given by specialists. 62 attended the class, 116 papers were written and 18 passed the examination. As an outgrowth of this

course the Henry electrical club was formed and the entire work was transferred to the American institute in January 1895. During the last two years two courses have been maintained annually.

The following explanation of the abandonment of the work at this center is made by the class conductor, Mr W. H. Freedman:

‘The men in some way received the idea, that if they pursued a sufficient number of courses they would receive a degree of electrical engineer. When I was compelled to deny this they were no longer interested and would not agree to write any farther papers. I have therefore dropped the matter entirely.’

Saratoga. Extension work here was begun as an experiment, very few believing that work so serious could be successfully maintained in this ‘summer city’. The first course however was well received, an unexpected amount of enthusiasm was shown and attendance at lectures and classes was excellent. The lecturer, Prof. J. R. Truax of Union university induced several to write papers and take the examination. But with the second year it was found that all the work of organization had to be repeated, interest in the work had to be roused afresh and many who had been enthusiastic before had grown tired of this form of amusement and were looking for something new. Among a few, however, there was so real a desire for extension courses, that the difficulties were faced again, and a second course was carried out in the hope that another winter would bring together a body of workers who could be relied on as a nucleus for the support of the center. This hope, however, did not seem to be realized and the president now reports that the center will probably be abandoned. The first need at Saratoga is doubtless for a free public library. When this is well established the other extension agencies may be expected to cluster about it.

Utica. Extension work has been maintained for four years in Utica, the first consisting of two short courses on art and music which though the most entertaining series given by the center were not productive of study and left the largest deficit.

This crippled the center throughout its history, even though the next course not only paid expenses but left a surplus, for some of the members became convinced that extension courses could not be supported in Utica and either relaxed their efforts or were actually obstructive.

In spite of this, however, financial success attended the work till last winter when a course on electricity was planned. This course was admirably conducted but in consequence of its subject was not popular. There was a deficit which the executive board paid individually. Two other courses were being planned but the managers were discouraged by the financial failure of the electricity course and voted not to proceed. The board has not since met.

It is unlikely that the work would have been abandoned for no other reason than financial difficulty with a single course. The feeling was general in the executive board, however, that the lectures would have been admirable if the auditors had been genuine students, while the audiences would have been satisfactory if the lecturer's methods had been more popular. But the two did not fit each other and the real explanation for abandoning the work lay in the fact that no demand for extension teaching among citizens of Utica was ever made plain to the managers. Even the most interested felt that the movement was artificially sustained and after a few years of effort without indications that knowledge and appreciation of the work were perceptibly increasing, the members of the board became discouraged and gave up the struggle. When the work is reorganized at Utica it will be the first duty of the new center to find out those who need and care for serious and consecutive study and to develop a desire for home education among others beyond school age. In such reorganization the department asks for no better secretary than Miss Ida J. Butcher who has served so efficiently during the last four years.

A comparison of numerical results during the last five years may be made by reference to the following table:

Comparative statistics 1891-96

YEAR	No. of active centers	No. of courses	Total attendance at lectures	Total attendance at classes	% of total attendance at class	Total no. of papers written	No. of examinations	ANSWER PAPERS			% of total attendance taking examination	% of class attendance taking examination
								Written	Accepted	% accepted		
1891-92.....	10	13	28,600	10,200	36	1,610	11	135	119	88	.4	1.3
1892-93.....	25	34	35,670	13,190	39	2,563	21	157	141	90	.4	1
1893-94.....	20	31	50,489	22,581	45	1,270	13	106	94	89	.3	.5
1894-95.....	21	29	37,594	17,673	47	1,029	13	100	89	89	.26	.56
1895-96.....	17	54	71,818	15,852	22	571	12	84	79	94	.001	.006

In any work in which so much is done by volunteers it is particularly difficult to get full and accurate statistics. Though we have taken every precaution and made great effort, the statements as printed are necessarily in some cases only approximately true, and in giving totals the figures reported sometimes do not include the attendance at entire courses, because no records were made or kept. In such cases we prefer to reduce the total rather than to add a doubtful item to records otherwise correct.

These reports show the greatest number of active centers in the second year of the work, and in this year also more papers were written, and as a result of this more examinations were given with a greater number of successful candidates. The attendance at lectures was highest during the past year due to the active work done at the Teachers college center. Owing to incomplete statistics from this center, however, the totals of class and paper work do not exhibit the results actually accomplished. With the location of Columbia university at Morningside heights, there is every reason to believe that the advantages of extension teaching of which appreciation is growing in northern New York,

^a This low percentage is due to 24 lecture courses at Teachers college center for which reports of class attendance could not be obtained.

will be more widely and thoroughly enjoyed than has been possible till recently.

Though it was prophesied at the beginning of the work that a decrease of interest might be expected after the first enthusiasm abated, the tables show that the decrease has not been as great as was expected and with the added cause of continued and widespread financial embarrassment, there is reason for congratulation that so many courses continue to be given. It is important to note however that the number of candidates for the examination was less during last year's work than ever before. This result is disappointing and ought not to have been expected. A main cause for this lies in the fact that at present, the New York extension passcards, unlike those given in England and in other states in this country, have no academic value. The founders of the work in New York recognized the danger of criticisms which come justly when extension teaching is misunderstood and overestimated, as well as of the cheap sneers of onlookers who can not know the real work done in some centers. It is to the wise conservatism of these founders of the New York extension department that our freedom from the charge of shallow work is largely due. But with growth in actual study among extension students it seems only fair that their efforts should receive some recognition corresponding to that given by the state to similar work done in the schools. Students can not attend the 10 weekly lectures and classes, do all the required reading, and write all the papers, without giving to the subject an amount of time and thought equal at least to that necessary for minor subjects in regular courses.

Inquiries come from working men and women regarding extension courses and the value of extension passcards, and disappointment is very plainly expressed when they learn the somewhat anomalous position of the University in encouraging extension work, while practically refusing to admit that it is of equal value with work done for the high-school diplomas or certificates required from law and medical students. Till concerted action similar to that of Oxford and Cambridge, is taken by our higher

institutions study by extension methods in New York will lack one of the most potent incentives to concentrated and continuous work. That some do the required work and take the examination from pure love for study is of course gratifying, but due recognition would not in most cases decrease the interest of these students while it would be helpful to others who perhaps most need the aid given by the peculiar features of extension teaching.

I pointed out certain facts and predicted exactly these results five years ago. There were others just as earnest and honest who insisted that the best results came only when people studied for study's sake and without regard to credentials. We have given their way a thorough and unprejudiced trial and endeavored to make it a success, but the new experiment added only one more confirmation to the usual educational experience. In exceptional cases the best results do come from those who ignore absolutely the credentials and rewards, but it is impracticable to hold the great majority of students up to continuous, systematic work and satisfactory standards without these incentives. We are now in the dilemma of playing with an educational shuttlecock. We refuse proper recognition to extension work because it is not equal in quantity or quality to that done in the teaching institutions, and it is not equal because it is refused equal recognition. The obvious solution is a plan by which work fully equal in both quantity and quality shall receive the recognition, while we can shut out that playing at education which has characterized much of the work masquerading under the extension name. I propose as a first step that we make a special effort in offering extension courses, syllabuses, traveling libraries, help by printed matter and correspondence, and whatever other aids may be found practicable for those who outside the ordinary teaching institutions are pursuing any of the subjects in which we already offer examinations in January and June, and in many also in March and September. The standards of work are thoroughly recognized. No additional expense would be involved as the papers are made and the examinations conducted at central points all over the state. These subjects cover a very wide field and it would be easy to add certain other subjects specially adapted to extension work and to enlarge, as we

have intended doing for other reasons, the already considerable field covered by the regents reading courses. No one will question that an extension student who can pass the regular examination must in some way have acquired a satisfactory knowledge of the subject. The man who can write page after page of clear idiomatic English with freedom from the usual faults of those not carefully trained, is deserving of some credential, however he may have acquired his knowledge, whether by attending an unincorporated school or by personal instruction, or by persistent reading of the best authors. It ought not to be a matter of serious concern whether his knowledge was acquired by lamplight at home or by sunlight in school, by formal recitations before a teacher in the class or as the result of lectures stimulating to careful individual study. In this recommendation I am recognizing fully our claim that the intellectual atmosphere of the school or college is worth perhaps as much as the knowledge acquired, but the present system of examinations is by law open to all residents of the state regardless of where they secured their information. The regents have no power, even if they wished to do so, to exclude from these state tests of acquirements in learning any person who has honestly striven to make himself worthy of the state's credentials.

When, however, we go beyond the range of the regents examinations covering the academic field, no farther step should be taken without careful consultation with the representatives of the colleges and universities, who will doubtless be very glad to join in formulating some system by which, without compromising the standards or establishing a system in any way prejudicial to our established colleges, the necessary encouragement can be given to those who are debarred from college residence. A fair trial of the present system has shown what can be expected from it. Statistics show that the number of people who do genuine extension work is very trifling compared to the large numbers who make it more or less an intellectual amusement. Even with the little thorough work done, the movement has been productive of great good, has stimulated reading and thought on higher planes so largely that even a pessimist can not question that it is worth more than it has cost. Its friends however must admit that till inducements enough are offered to lead a larger percentage of students to write papers,

attend the classes, study at home and make it a matter of serious effort, we have no right to offer the credentials awarded to thorough work in our best teaching institutions or to count the extension work as belonging in the same class. I predicted five years ago in the early days of the extension department that the unreasonable claims of its overzealous friends would be the most serious obstacle with which we had to deal. I am confident that our experience, disappointing as it must be to those enthusiasts who insisted that here at last was a royal road to learning, is yet the most healthful thing that could have occurred and that we can look forward with much greater confidence to the future of extension teaching since it has been relieved of unreasonable hopes and theories which served only to embarrass those who recognized its proper place in the system of education and were willing to take the necessary time for substantial, healthful growth.

Extension teachers. The University lists now included 164 lecturers offering 293 courses. 13 lecturers, 24 courses and 20 single lectures have been added during the year, while only 3 names have been dropped. A complete record of changes follows.

LECTURERS ADDED

Stainton E. Barrett, 169 7th st. Buffalo, N. Y.

Colonial period of the U. S. from 1600 to 1753.

David P. Barrows, M. A., 325 W. 52d st. New York.

B. A. Pomona college 1894; M. A. University of California 1895; instructor in history, Pomona college 1895; student in school of political science, Columbia 1895- .

Economic history and social conditions: 1 Economic history of England before 1760; 2 Industrial revolution and its consequences to English labor; 3 Economic progress in the U. S.; 4 Foreign immigration to the U. S.; 5 Concentration of industry; 6 Concentration of population; 7 Problems of poverty and ignorance; 8 History of poor relief. English poor law. Modern agencies; 9 Labor question. Trade unionism. Labor difficulties; 10 Socialism, political and economic. The movement in Germany, England and the United States.

Foods of the Coahina indians.

Woman in savage life.

Development of speech illustrated by an indian language.

Harry A. Cushing, M. A. *Tutor in history*, Columbia university New York.

B. A. Amherst 1891; M. A. Columbia 1894; instructor in history, Beloit (Wis) college academy 1891-93; university fellow in history, Columbia 1894-95; prize lecturer in history, Columbia 1895-96; assistant in history, Barnard college 1895-; tutor in history, Columbia 1896-; member American historical association, American economic association, American academy of political and social science; writings have appeared in *American historical review*, *Political science quarterly*, Report of American historical association, *Harper's weekly*, etc.

European history since 1815 with special reference to the continent.

See entry under W. A. Dunning.

William A. Dunning, M. A., Ph. D. *Adjunct professor of history and political philosophy*, Columbia university, New York.

Author numerous articles in *Political science quarterly*, *American historical review* and other periodicals, *International encyclopedia*, etc.

European history since 1815 with special reference to the continent (*given with H. A. Cushing*): 1 Period of triumphant reaction, 1815-30; 2 Revolutionary wave of 1830-32; 3 Early phases of the eastern question; 4-5 Revolutionary wave of 1848-51; 6 Unification of Italy; 7 Prussianizing of Germany by King William and Bismarck; 8 Rivalry of France and Prussia and its results; 9 Eastern question and latest partition of Turkey; 10 Recent political and social tendencies.

Warner Fite, Ph. D. *Instructor in Latin and philosophy and dean of the faculty*, Williams college, Williamstown, Mass.

B. A. Haverford college 1889; Ph. D. University of Pennsylvania 1894; instructor in philosophy, Williams 1894-; dean of the college 1895-; member American psychological association; author *Priority of inner experience*, *Philosophical review*, March 1895.

Physiological psychology: 1 The brain and nervous system; 2 Skin sensations, taste and smell; 3 Perception of position and movement of the body; 4 Sensations of sound; 5 Sensations of sight; 6 Intensity of sensations. Weber's law; 7 Development of space-perception; 8 Reaction; 9 Action and will; 10 Mind and body.

Mrs Cornelia K. Hood, LL. B. *Lecturer*, Brooklyn institute of arts and sciences, Brooklyn, N. Y.

LL. B. University of the city of New York 1893; law lecturer, Brooklyn institute 1894-; member and director Woman's legal education society; member League for political education, State charities aid association of New York; editor *American woman's journal* and *Business woman's journal* 1892-94.

Laws affecting persons: 1 Woman's legal status, ancient and modern; 2 Nature of law; 3 Marriage; 4 Legal relations of husband and wife; 5 Property rights of married women; 6 Divorce and lawful separation; 7 Parent and child; 8 Legal relation of employer and employee; 9 Agents and brokers; 10 Patents.

Practical business law: 1 Contracts and their construction; 2 Negotiable paper, checks, drafts; 3 Promissory notes, bills of exchange; 4 Statute of frauds; 5 Transfer of property, gift, sale; 6 Wills; 7 Laws of inheritance; 8 Probate, executors, administrators; 9 Landlord and tenant; 10 Mortgages.

Mrs Louise Seymour Houghton. *Associate-editor* New York *Evangelist*, 156 5th av. New York.

Author of a number of books for the young published by the Presbyterian board and American tract society; holder of George Wood prize medal 1895; author *Life of the Lord Jesus* (Bible study union pub. co. 1896), *Antipas, Son of Chuza and others whom Jesus loved* (Randolph 1896), pamphlets on French protestantism; editorial contributor to *Frank Leslie's illustrated weekly* and *Lippincott's magazine* 1880-88; editor of the *American messenger* 1888-; occasional contributor to *Century*, *St Nicholas*, *Youth's companion*.

Literary study of the Old testament: 1 The Daybook of the Eternal: what the Old testament is and the reason for literary study of it; 2 Early folk-lore; 3 Poetry of the Old testament; 4 Heroes and heroism (the epic); 5 Eastern light on the story of Elisha; 6 Love stories of Israel (idyls, pastoral and drama); 7 A parable of divine love, *Hosea*; 8 Secular faith, *Proverbs* and *Ecclesiastes*; 9 The Hebrew Utopia (prophecy); 10 The law and modern society (mosaic institutions).

Francis W. Howard. Columbia university, New York.

Production of wealth : 1 Economic science ; 2 Productive system of society ; 3 Labor as a factor of production ; 4 Natural agents and capital ; 5 Production and consumption.

Richard Austin Rice, M. A. *Professor of American history, literature and eloquence*, Williams college, Williamstown, Mass.

B. A. Yale 1868 ; M. A. Williams 1883 ; professor in University of Vermont 1875-81 ; professor of American history, literature and eloquence, Williams college 1881- .

America and Europe in the 18th century : 1 Character of the 18th century ; 2 Models of colonial expansion and government ; 3 Physical advantages in the struggle for supremacy in the new world ; 4 Phases in the struggle for supremacy in the new world, 1492-1755 ; 5 Colonial relations ; 6 Wars in Europe and America ; 7-8 American revolution ; 9 Constitution of the United States ; 10 Close of the 18th century.

History of protestant reformation.

Single lectures and short courses on : History of the fine arts ; Ghosts ; or, the invisible reality of art ; Architecture ; The Rhine ; Greek gymnastic sculpture ; Schools of painting (1 to 6 lectures) ; Schools of engraving (1 to 5 lectures) ; Great portraits in sculpture and painting ; Art of Egypt (1 to 2 lectures) ; Rembrandt (1 to 2 lectures) ; Decorative art (1 to 2 lectures) ; Modern French painters.

W. Clarence Webster, B. A. 164 E. 38th st. New York.

B. A. Albion college 1887 ; teacher history and mathematics, Grand Prairie seminary, Onarga, Ill. 1887-89 ; graduate student, Johns Hopkins university 1889-90 ; professor of history, Cornell college, Mt Vernon, Ia. 1890-93 ; lecturer for the American society, 1892-93 ; lecturer for University of Chicago 1893-95 ; independent lecturer in Iowa, Minnesota and Michigan 1895-96 ; fellow Columbia university 1896- .

Making and makers of our republic, 1750-1850 : 1 Struggle for independence ; 2 The 'critical period' ; 3 Making a new constitution ; 4 Rise and fall of the federalists ; 5 A chapter in Jeffersonian democracy ; 6 Nationality vs democracy ; 7 Andrew Jackson and his 'reign' ; 8 J. C. Calhoun and the 'lost cause' ; 9 Daniel Webster and nationality ; 10 Henry Clay and the whigs.

Homer F. Yale, M. A. *Principal*, Temple college school of oratory and elocution, Broad and Berks st. Philadelphia, Pa.

B. A. Colgate 1891, M. A. 1894; post-graduate student, Colgate 1891-94; professor of elocution, oratory, rhetoric and literature, Neff college of oratory, Philadelphia, Pa. 1894-96; principal Temple college school of oratory and elocution 1896-.

Elocution and oratory: 1 Technic and art; 2 Elocution, or vocal interpretation of literature; 3 Oratory, or original vocal expression for persuasion; 4 The three languages, words, tones, gestures; 5 Personality in art; 6 Imagination in art; 7 Ethics in art; 8 Reading; 9 Rhetoric of oratory; 10 Extempore speech.

English literature.

Charles A. Young, Ph. D., LL. D. *Professor of astronomy* Princeton university, Princeton, N. J.

Member National academy of sciences; foreign associate of the Royal astronomical society of Great Britain.

Descriptive astronomy: 1 The sun; 2 The sun, spectroscopic; 3 The moon; 4 The planets; 5 Meteors and comets; 6 The stars and nebulae.

Henry Zick, Ph. D. *Professor of German*, Adelphi academy, Brooklyn, N. Y. .

Graduate of Heidelberg gymnasium 1880; Ph. D. Heidelberg university 1887; professor of German, Adelphi academy 1893-; lecturer on German literature, Brooklyn institute of arts and sciences.

German literature of the 19th century: 1 The romanticists: the founders of the school; 2 The romanticists: Eichendorff, Fouqué, Chamisso; 3 Suabian school of poets: Schwab, Kerner, Uhland; 4 Young Germany and Heine; 5 Henry Heine; 6 Austrian poets: Lenau; Gouen; 7 The novel of the 19th century; 8 Scheffel: *Ekkehard*, *Trompeter of Säkkingen*; 9 German drama from Schiller to Wildenbruch; 10 Wildenbruch. Outlook.

Göthe's *Faust* (Bayard Taylor's translation): 1 Göthe's life; 2 Faust legend; 3 The poem: contents: 4 The prologue in heaven; 5 Faust's monologues; 6 The wager; 7 Closing scenes of part 1; 8 Part 2; 9 Symbolism; 10 Philosophy of Faust.

Great poets and poems of German literature: 1 The great epics, *Nibelungenlied* and *Parsifal*; 2 Minnesingers; 3 Lessing: life and lyrics; 4 Lessing: *Minna von Barnhelm*; 5 Lessing: *Nathan the Wise*; 6 Schiller: life and minor poems; 7 Schiller: dramas, *Wallenstein*, *Wilhelm Tell*; 8 Göthe: life and lyrics; 9 Göthe: *Tasso*, *Iphigenia*; 10 Göthe: *Faust*.

Illustrated lectures: Martin Luther; Franco-Prussian war; The Rhine and its legends; Heidelberg student life; Berlin and Munich; Paris.

NEW COURSES OFFERED

R. K. Duncan, B. A. *Instructor in science*, Auburn high school, Auburn, N. Y.

Radiant matter and X rays.

William H. Goodyear, M. A. *Curator*, Department of fine arts, Brooklyn institute of arts and sciences, Brooklyn, N. Y.

History and criticisms of Italian art and of painting by the old masters: 1 Historical significance of early Christian art; 2 Decorative significance of early Christian art; 3 Medieval ideal of painting; 4 Dawn of the renaissance in sculpture; 5 Dawn of the renaissance in painting; 6 Zenith of the renaissance in painting: old masters of the 16th century; 7 Decorative ideal of renaissance painting: Raphael's frescos; 8 Spiritual ideal of renaissance painting: Michel Angelo; 9 Decadence of renaissance painting; 10 First phases of modern painting: Dutch school of the 17th century.

Herbert E. Mills, M. A., Ph. D. *Professor of economics*, Vassar college, Poughkeepsie, N. Y.

Labor problem: 1 Evolution of industrial organization; 2 Trusts; a modern industrial organization; 3 Condition and complaints of laborers; 4 Labor organizations; 5 Conciliation and arbitration; 6 Cooperation; 7 Labor legislation; 8-9 Socialism; 10 Social reform.

Mrs Fanny Gordon Sears, 2 River Terrace, Binghamton, N. Y.

Music: 1 Science of music; 2 Music of the ancients; 3 History of the oratorio; 4 History of the opera; 5 Development of instrumental music; 6 Modern music.

Charles Sprague Smith, M. A. Carnegie building, 56th st. and 7th av. New York.

Comparative study of literature: 1 Medieval French epic: the Song of Roland; 2 Romances of chivalry in Italy: Ariosto's *Orlando Furioso*; 3 Books of chivalry in Spain: Cervantes' *Don Quixote*; 4 The Cid of history and legend: the poem *My Cid*; 5 Cid legend as dramatized by Guillen de Castro; 6 *Le Cid* of Corneille; 7 Nibelungen saga: the origins and the old Norse form; 8 *Nibelungenlied*; 9 Wagner's trilogy; 10 Comparative study of literature.

Henry P. Warren, L. H. D. *Principal*, Albany academy, Albany, N. Y.
New York state history.

NAMES WITHDRAWN (*see* circular 31)

James J. Thom, B. D.

Charles H. Thurber, M. A. Associate professor of pedagogy, Chicago university and Dean of Morgan Park academy.

Charles W. Tooke, M. A. University of Illinois, Urbana, Ill.

Free lectures to the people, New York. The course for 1895-96 opened Oct. 26 and closed March 30. Lectures were given at 30 different places, 14 more than in 1894-95. The new centers were all chosen near the homes of the working class. That the lectures are appreciated is shown by the steadily increasing attendance. At the first course in 1889, 186 lectures were given attended by 22,149 people. During the last year, 1040 lectures were given with an attendance of 392,733. The attendants are almost all adults and include a large proportion of women.

At the chief centers, 39 lectures were delivered and those not given in courses were so arranged as to keep related subjects together. Syllabuses with reading lists were provided at each course. 795 lectures were illustrated by stereopticon views and 73 by experiments. Five lanterns were bought and each hall supplied with a permanent screen. The subjects include physiology and hygiene, natural science, travel, history and civics, art, literature and social science; the lecturers are all well known in their respective specialties.

PROGRESS OUTSIDE NEW YORK.

Notes compiled from university extension periodicals and official circulars and reports.

Massachusetts. The program of the Lowell institute lectures of Boston for 1895-96 included the following subjects: Graphic statics with applications to roof trusses and arches; Plane analytic geometry; Descriptive geometry; General chemistry of the non-metallic elements; Steam boilers, a special course for engineers; Rise and development of prose fiction in France, beginning with the Amadis romances (lectures in French); Electric light and power measurements; Modern geometry; Metallurgy of copper; Art and science of war; Critique sur l'architecture contemporaine en France; Contemporary European history and politics; Romanesque architecture; Differential calculus; Navigation and nautical astronomy; General chemistry of the metallic elements; Technology and analysis of oils; Irregularity of employment: causes and relief; Organic chemistry; Anglo-Saxon. Each course consists of 12 lectures.

The only conditions of attendance are that candidates must be 18 years old and must make written application (inclosing stamped envelop properly addressed for reply) to Prof. H. W. Tyler, Massachusetts institute of technology, specifying the course or courses they wish to attend, their present or prospective occupations and, if the course is of a nature demanding preparation, the extent of their preliminary training.

Philadelphia. The report of the American society for 1895-96, the fifth year of its work, states that since the organization of the society 614 lecture courses have been given in 191 different places with a total attendance of 106,285.

With the close of 1895 the guarantee fund of \$6700 which was secured at the beginning of the work for a period of five years expired. A new fund has been raised and it is hoped that this may be increased to \$10,000 to enable the society to work with greater efficiency.

Of the active centers in 1895-96, 25% were new. 104 courses were given of which 42 were financially successful, 20 had deficits, six were free and 36 were not reported. The total attendance was between 15,000 and 20,000 persons. An increase in the number of free lectures and lectures to workingmen is noted. Ten courses

were given to workingmen, seven in civics, two in American history and one in English history. A course in English history was also given to the colored people in Philadelphia.

Mr Hudson Shaw of Oxford, Eng. who lectured for the society during the year reported that he found a steady growth of 'true students at almost every center.'

Chicago. The University of Chicago makes an encouraging report of its four years of extension teaching. Below is given a comparative view of the work of the lecture-study department.

YEAR	No. of centers	a No. of courses	Average attendance at lectures	Average attendance at class	Average no. of weekly papers	No. examined
1892-93	67	123	26,728	12,085	712	481
1893-94	72	89	14,063	8,409	533	213
1894-95	95	128	23,757	17,775	Very few centers reported	Examinations discontinued except for 12-lecture courses
1895-96	81	120	25,345	12,360	Very few centers reported	

The decrease in number of courses and attendance during the second year is attributed to the financial panic of 1893 and the presence of the World's Columbian exposition. An effort is being made to increase the number of 12-lecture courses and to secure sequence of courses where possible.

Mr Newnan Miller, secretary of the Correspondence-study department, reports a steady increase in the extent to which this work is carried on. In 1892-93, 28 courses were in progress; in 1893-94, 29 courses; in 1894-95, 34 courses and in 1895-96, 87 courses. While the number of non-matriculated students has decreased, the number of matriculated students has increased from 61 in 1892-93 to 288 in 1895-96. A large number of the matriculated students take the examinations and secure credit for the work done.

The Class-study department carries on its work by means of afternoon, evening and Saturday classes, organized wherever six or more students are found wishing to pursue the same line of work.

^aA course consists of six lectures, a 12-lecture course being counted as two courses.

Several permanent class-study centers have been established. 11 classes with an enrolment of 129 students is reported for 1892-93 and 111 classes with an enrolment of 1142 students for 1895-96.

The *University record* of Chicago makes the following general statement in regard to the extension work of Chicago university :

The influence which the University is exercising throughout the communities of this and neighboring states, in its system of local lecture courses, is growing and strengthening each year. The results, thus far achieved, are such as fully to justify the efforts that have been made in this department of our work. Experience has shown the desirability of certain changes in the system, and others will doubtless appear from time to time as the outcome of further experience. But the underlying principle of the undertaking is more and more fully recognized, both by the University authorities and by the public, to be a thoroughly sound one.

No one ever supposed that the demand for systematic courses of University lectures in literature, science and art was universal and imperative any more than is the demand for the very best in other things. The need of such work is, however, more and more manifest in our American life, and the University is doing very much to convert this need into a demand. We are engaged, in a word, not simply in supplying an existing demand, but in the even more difficult and important work of creating in the community at large that demand for the very best of everything in the intellectual, esthetic and moral world which is at once the evidence of, and the surest means toward, the higher civic life. We may fairly ask the aid and sympathy of all classes of the community in this important branch of the University work.— *University record*, 1:5-6

Wisconsin. The University of Wisconsin reports that more university extension work was done the past year than in all the other years since the organization of the department. 57 courses were given by 19 lecturers in 43 different cities and towns. Milwaukee had eight courses ; Janesville, Oshkosh, Racine, Chippewa Falls, Cedarburg, Sheboygan and Stoughton 2 courses each, and 35 towns had one course each. Sec. Jerome H. Raymond, of the Extension department reports that the outlook for the coming year is most encouraging.

Colorado. University extension work was begun at Colorado college in March 1894 when special classes were organized for those not wishing to undertake regular college work. The interest aroused was so encouraging that in the fall of 1894 four courses were given. In 1895-96, the original plans were somewhat modified and the

lectures were given in the high school building with the cooperation of Sup't P. K. Pattison and Prin. G. B. Turnbull. The work opened with five lectures on Early English life and literature which proved so popular that it was found necessary to remove to a larger hall. This was followed by three lectures on Göthe's *Faust*, three lectures on science, two lectures on Dante and Benvenuto Cellini, two lectures on Greek and Roman views of death, and one lecture each on Compulsory insurance in the German empire, the Single tax and modern French novelists.

Scotland. University extension in Scotland has suffered a great loss in the resignation of Dr R. M. Wenley, secretary of the Glasgow university extension board, who has accepted the senior professorship of philosophy in the University of Michigan. University extension has not met with great success in Scotland, and Glasgow is the only university which has persevered in the work. This was largely due to the labors of Dr Wenley who gave 50 out of the 102 courses conducted by the Glasgow board since 1887.

Ireland. The Belfast society reports that the year 1895-96 was one of the most successful. Courses were given on electricity, astronomy, physiology, early English history and literature and Tennyson, all of which were well attended. A course was given at Lisburn and the society is trying to enlarge the work by establishing centers in neighboring towns.

Cambridge, England. The new scheme of certificates adopted by the Cambridge syndicate has been effective in increasing continuous and systematic work. The establishment of the sessional certificate increased the number of sessional courses from seven in 1894-95 to 12 in 1895-96 while 106 students obtained sessional certificates as against 69 in 1894-95. To aid students at centers which could not arrange two courses in sequence in the session, the syndicate adopted the plan of combining the work of the lectures with the passing of a paper in the higher local examination. Six students at the Colchester center took the higher local examination in Greek history in June; five passed and two of these with honor. It is urged that many advantages would result from establishing a closer connection between the local lectures and the higher local examination

and granting a diploma to external students pursuing a course of study under these systems.

A new technical and university extension college has been established at Colchester. The college is a municipal institution supported by the town council. Mr Philip Lake of St John's college was appointed principal for one year.

Exeter technical and university extension college. The number of class entries for 1895 was 516 on the technical side and 731 on the university extension side. 100 teachers were in attendance at the normal classes organized for pupil teachers. These classes were specially successful and the effect on the position of pupil teachers in the queen's scholarship examination was marked.

London. The number of courses given and of certificates awarded during 1895-96 by the London society for the extension of university teaching, shows an increase over last year's report. 14.4% of the students attending the lectures gained certificates. The progress of continuous study is very satisfactory, 112 out of the 148 courses given during the year being arranged in educational sequence. In many cases this policy has proved to be of financial as well as educational advantage. Owing to the increased number of sessional courses it is becoming customary to print syllabuses of 25 lectures instead of 10 as formerly.

Excellent work has been done by the London local centers association in bringing the centers into closer union, in preventing overlapping in regard to subjects chosen and in spreading information of each other's work.

The work at the industrial centers is encouraging. The Technical education board of the London county council supplied funds for courses at Bermondsey, Camberwell, Clerkenwell, Limehouse, Poplar, Fulham and West Norwood, and as a result of these courses, two new centers were formed. The pioneer courses supported by the Technical education board are followed by more systematic courses wherever possible. On account of the poverty of the districts, it is necessary to endow many of the industrial centers that the fee for the lectures may be placed as low as possible. The council of the society reports that funds are greatly needed for this purpose.

More than half the summer courses of the past year were given at industrial centers. In connection with the courses many of these

centers form reading circles, classes at neighboring institutions to supplement courses in physical science, and field clubs for excursions in connection with courses in botany and geology.

Oxford. The Oxford delegacy reports that 'the main features of the year's work have been : 1) the satisfactory maintenance of the ordinary work of the delegacy organized in connection with local committees ; 2) the cessation of lectures organized by the Technical instruction committees of county councils in conjunction with the delegacy ; 3) the successful development of the work carried on by the University extension college at Reading ; 4) the increasing recognition of the importance of the contribution made by university extension lectures to the training of pupil teachers.'

Courses were given at 103 centers attended by 18,387 persons: 5902 attended the classes, 1480 wrote papers and 804 passed the examinations. Though the number of courses was 34 less than in the previous year the average attendance of each course increased from 129.25 to 144.7.

The courses were on the following subjects: history 61; literature 38; natural science 16; art 6; economic history and theory 6.

Among the most successful centers were Oldham, Birmingham, Gloucester and Bolton which are distinctly artisan in character. At Oldham the average attendance at each lecture was 1000. The reports from the district directors who were appointed at the beginning of the year are encouraging and reveal the need of similar supervision in other districts specially in the northwest.

Reading university extension college. The most important event of the year was the incorporation of the college on January 4, 1896. 670 students were registered. The grant received by the college from the Board of agriculture was £700, £200 more than in 1894-95. The Royal agricultural society nominated two representatives to serve on the Oxford and Reading joint committee and selected Reading as the center for the examination of candidates for the recently established diploma in the theory and practice of dairying.

Victoria university. Victoria university whose constituent colleges are Owens college, Manchester, University college, Liverpool and Yorkshire college, Leeds, has carried on extension work since 1886. In 1895-96, 102 courses, 20 of which were pioneer courses,^a

^aCourses without paper work or examination.

were given. The attendance at ordinary courses was 4500; at pioneer courses, about 2400. The average attendance at agricultural courses given with the aid of county council grants was 42. These courses exert an important influence in the districts where they are given and are gradually rousing the farmers to the need of farther training for the coming generations. 687 students took the examinations and 613 passed. Pupil teachers' courses were given at Liverpool, Manchester, Salford and Oldham and 376 certificates were awarded.

Special regulations were made for practical examinations in horticulture at the close of long practical courses, on the scientific culture and treatment of healthy and diseased plants, though certificates are given only to those candidates who already hold certificates in theoretical horticulture.

Germany. The city of Hamburg has for a number of years maintained an educational institution for its citizens, the plan of which corresponds closely to that of university extension, though under this name the movement has not made great progress in Germany.

The opportunity for the work in Hamburg sprung from the abolition in 1882 of the Akademisches gymnasium, an institution intermediate between school and university. At the same time it was decreed that the laboratories and collections together with other educational institutions of the state, should be used for the benefit of the people of Hamburg and the neighboring cities. According to this plan the directors of the botanical garden, the observatory, the museum of decorative arts, the museum of natural history, and the chemical and physical laboratories give public and private lecture courses on their special subjects. In addition to these lectures, 12,000 marks (\$3000) a year was granted to pay for courses and single lectures on other topics by prominent men. The board of education has charge of the institution.

The lectures are open to all adults and popular lectures are free. A fee of five marks (\$1.25) for the term may be charged for the private courses though practically there are very few courses for which a fee is really demanded. There are two terms one from the middle of October to Easter and the other from the middle of April to August. A special fee is charged for practice work in the laboratory the use of which is limited to those who satisfy the director

that they are sufficiently advanced to make proper use of the opportunity.

Special courses and exercises are offered to teachers who wish to qualify themselves for positions in a higher grade. These courses are free but are not usually open to the public.

An advance has recently been made in planning a three years' course of work. Each lecturer will give a complete but popular survey of his subject in a series of courses covering six terms. No examinations are given.

A result of the courses in decorative art is noted in the revival of these handicrafts among the tradesmen of Hamburg and the increasing demand among all classes for artistic decoration of interiors.

Vienna. The University of Vienna reports for its first year of extension work 58 courses of six lectures each with a total attendance of 6172. The courses were divided as follows: natural science 15, medicine 17, history 13, literature and art 8, jurisprudence 5. The courses on medicine were the most largely attended, and at some courses 70% of the attendants were working men.

The fee for each course was one krone (20 cents) and syllabuses were sold for 10 kreutzer (4 cents). The total net cost of the work amounting to about 9000 florins (\$4320) was paid by a government grant of 7500 florins (\$3600) with some additional private subscriptions. The method is very similar to the extension system but there are no examinations.

France. The movement for adult education in France is meeting with popular favor as is shown by the increased number of courses and the active part taken in the organization of the work by the mayors in a number of districts.

During the past year 14 continuation schools were opened at Amiens. 302 courses were given in the Vosges, 39 of which were for young girls, and 50 courses in Somme with an attendance of 600 students. 15 communes in the Department of Sarthe voted sums for paying the teachers, varying from 40 to 100 francs. As yet the lectures are on miscellaneous subjects.

Russia. University extension work was begun in Russia in the fall of 1895 by the University of Odessa, at the suggestion and

under the auspices of the South Russian society for scientific research. The English plan of Michaelmas and Lent terms of three months each has been adopted and as many of the English methods as were practicable. At present the work is limited to scientific subjects of which anatomy has proved the most popular. The average attendance at all courses has been not less than 200. The fee is 20 rubles (\$15.40) but teachers are admitted at half fee and those who can not pay are given free tickets.

Belgium. University extension work has been successfully conducted by the Université libre of Brussels in spite of vehement opposition. The interdict issued by the senate of the university forbidding the professors to deliver extension courses has been repealed. The work was begun in 1894 and during the past year 19 courses attended by 4250 students, were given at 10 centers in different parts of Belgium.

INSTITUTES IN NEW YORK

Brooklyn institute of arts and sciences. Active work began on Oct. 1 with an address by Pres. M. W. Stryker of Hamilton college, on the Stewardship of knowledge and closed in June with an address by Pres. J. G. Schurman of Cornell, on A sound philosophy a basis for a true education. The number of addresses, lectures and exhibitions open to members was 500 or about 15 for each of the 34 weeks of the season. A course of lectures by American authors included the names of John Burroughs, Rev. Henry Van Dyke, Mrs Frances Hodgson Burnett, Prof. John Fiske, F. Marion Crawford, and Richard Watson Gilder. The increased demand for admission to the concerts and dramatic readings has made it necessary to issue reserved seat tickets to all seats in Association hall and these are furnished to members at a nominal charge.

The following changes in the presidencies of departments were made:

Architecture, Isaac E. Ditmars

Chemistry, Elias H. Bartley

Entomology, Lyman A. Best

Geology, Prof. John Mickleborough

Mineralogy, Wallace Goold Levison

Pedagogy, Charles D. Larkins
Photography, J. Frederick Hopkins
Physics, Prof. John S. McKay
Zoology, Oliver D. Clark

The institute extension courses were as follows:

Garrett P. Serviss, Astronomy
Dr Smith Ely Jelliffe, Vegetable histology
Prof. Peter T. Austen, Principles of modern chemistry
Garrett P. Serviss, Places of great historical and natural interest in Europe
Miss Louise Both-Hendricksen, John Ruskin
Mrs Harriet Otis Dellenbaugh, Browning
Mme R. J. H. Gottheil, 'Les contemporains'
Prof. Henri Michaud, Le Theatre d'Alfred de Musset
Prof. Henry Zick, German literature to the death of Göthe
Prof. Henry Zick, German literature since Göthe
Prof. Menco Stern, Göthe's *Faust*, part 2
Prof. Thomas Davidson, Dante
Prof. William Cranston Lawton, Masterpieces of the Greek drama.
Dr Lewis G. Janes, American politics, European politics, Civil government, Sociology
Frederick M. Corse, General political economy, Money, credit and finance
Prof. John P. Davis, American history
Mrs Cornelia K. Hood, Law lectures for women
Mrs Olive Thorne Miller, Birds

From Dec. 28 to Jan. 25 the departments of architecture and archeology gave an exhibition of the entire collection of enlarged photographs of ancient and medieval Italian architecture and sculpture made by Prof. W: H. Goodyear and Mr J. W. McKecknie during their expedition to Italy. Lantern photographs and other photographic work by members of the department of photography were exhibited on the first and third Friday evenings of each month and from May 3 to June 3 the fourth annual photographic exhibition was held in the galleries of the Brooklyn art association.

Yonkers woman's institute. The following tables give a summary of the work done during 1895-96.

YONKERS WOMAN'S INSTITUTE CLUB CLASSES, 1895-96

Subject	Instructor	Evening	TOTAL NO. OF		ATTENDANCE			
			Lessons	Pupils	STUDENTS		Teachers and committees	Visitors
					Total	Average		
Calisthenics	Miss Clark	Friday	25	30	640	25	80	464
Cooking	Miss Wilson	Monday Tuesday	60	42	643	11	73	50
Plain sewing	Mrs Houghton	Monday	26	12	103	4	26	...
Dressmaking	Miss Cronk	Friday	13	12	62	5	13	...
Millinery	Miss Charlton	Thursday	7	6	24	3	7	...
Fancy work	Volunteers	Thursday	16	20	125	8	41	...
Dressmaking	Miss Schenck	Tuesday	23	20	202	9	23	...
Writing	Mrs Mason	Thursday	10	18	112	11	10	...
Literary	Volunteer leaders	Thursday	3	15	24	8	3	...
Totals			183	175	1935	84	276	514

A general class in dressmaking was held on Wednesdays. 13 pupils were registered and the average attendance was seven. Private classes were also held in elocution, German, Delsarte and painting. In the elocution class, eight pupils registered and the aggregate attendance was 100; in German, six pupils registered with an attendance of 35; in Delsarte, 20 pupils with an attendance of 150; in painting, three pupils with an attendance of 12.

REGISTRATION IN INSTITUTION DEPARTMENTS, 1895-96

Trustees and corporate members.....	14
Active associate members.....	36
Library borrowers.....	740
Woman's institute club.....	169
Day classes.....	50
Civic league.....	80
Woman's exchange.....	88
Employment bureau.....	56
Household branch.....	415
Penny provident fund, Branch of New York.....	583
Public school cookery classes.....	144

Approximate average attendance in building for all purposes (except Penny provident fund) is 3000 per month.

INSTITUTE LECTURES AND ENTERTAINMENTS, 1895-96

Date	Subject	Lecturer	Attendance
Nov. 21	Norway (illustrated)	W. A. Butler	650
Dec 20.	Holy land (illustrated)	R. E. Prime	200
Jan.	Health (5 talks)	Miss E. M. Lindley	96
"	Reading	Mrs Laurens Lennox	100
Feb. 18	Weimar (illustrated)	J. P. Worden	150
" 25	Scotland in picture and song	Mr & Mrs John Reid	200
March 9	Constantinople (illustrated)	Mr Samuelian	180
"	Shakspeare (3 readings)	Mrs Laurens Lennox	46
" 17	Bicycling	Miss E. M. Lindley	35
" 30	Niagara (illustrated)	C. E. Gorton	125
April 21	Musical	Miss C. B. Lawson	150
May 7-8	Florida (illustrated)	Miss M. M. Butler	250
" 15	Calisthenic class exhibition	.....	210
	General topics (5 club talks)	.....	160

The Civic league held five meetings and attended five lectures on Civil government by Miss Jane M. Slocum. The aggregate attendance at these lectures was 75.

INSTITUTES OUTSIDE NEW YORK

Wells memorial institute, Boston. Evening classes and free lecture courses have for years been offered to the working people of Boston by Wells memorial institute. The report for 1895-96 indicates that this educational feature of institute work is becoming the most important. The total registration for all lectures and classes

was 2014, a gain of 712 over the preceding year. Evening classes in mechanical drawing, dressmaking, millinery, elocution, dancing and deportment are conducted for beginners and advanced students. The lecture courses for the year included practical electricity, steam and steam engineering, English literature and the poets, emergency and hygiene for women. The attendance at the courses in steam engineering was largely increased by the new regulation requiring all engineers to pass a state examination and obtain a license in order to retain their positions.

The lectures on English literature, given by Miss Bates, Miss Scudder and Miss Jewett of Wellesley college were the first step toward university extension. It is hoped that several extension courses may be given each year in cooperation with Denison and South End houses.

In addition to the educational work, there are a Ladies' advisory board and special committees on entertainment, membership, finance and savings, and library.

The present membership is 1557; 1156 men and 388 women, 18 sustaining members paying \$10 per year and five life members. Members must be working people not less than 18 years of age and a fee of \$1 per year is payable in advance.

People's palace. The People's palace in Mile End road, East London is the realization of Sir Walter Besant's idea in his well known novel, *All sorts and conditions of men* in which he suggests a palace of delight to promote the amusement and at the same time elevate the social and intellectual condition of working men and women. The foundation on which the People's palace was established was the Beaumont philosophical institute. In 1840 John H. Beaumont died leaving a fund for the education and entertainment of the East end population. A certain amount of good was accomplished for several years when owing to mismanagement the work came to an end. Application was made to the charity commissioners to rescue this fund and Sir Edmund Hay Currie was appointed chairman of the Beaumont trustees. \$60,000 of the original bequest was recovered and in 1881 Sir Edmund Currie began collecting \$250,000 for a large institute in East London. The publication of *All sorts and conditions of men* in 1882, though the author was ignorant of

the plan of the Beaumont trustees, brought money and interest to aid the plan and gave the institute its name.

Queen's hall was opened by the queen May 14, 1887, and active work' was begun Oct. 3. The technical schools were opened in October 1888 by the master and wardens of the Drapers' company to whose generosity the institute owes its assured financial position. The library is back of the Queen's hall. Communicating with the library and Queen's hall is a winter garden filled with palms, flowers and tropical fruits. Separate buildings are devoted to the gymnasium and skating rink, swimming bath, schools of art and music, the technical trades and the electric installation which supplies the lighting throughout the building. A system of subways connects the schools with the main building.

There are two departments, the recreative and the educational. In addition to the concerts, lectures, entertainments and social gatherings, there are numerous athletic clubs, literary societies and miscellaneous organizations. The educational classes are carried on in connection with the science and art department, South Kensington, the City and guilds of London institute and the Society of arts. The increase in the number of students each year is most encouraging. The most popular subjects are drawing, machine construction, mechanical engineering, and tailors' cutting, the latter forming one of the principal trades of the district. A technical day school for boys is one of the most important educational features. Applicants must be over 12 years of age and must have passed the fifth standard in the public elementary schools. The course includes general instruction, shop work and laboratory work. The tuition fee is sixpence a week, but a great number of competitive scholarships have been provided.

Success or failure of individual centers. Local success usually depends on the persistent, intelligent work of some one man or woman who realizes that an extension center, like a wagon, can not run itself except down hill, neither can it be run successfully by a score or more of half-hearted people pulling in different directions. Often work successful in a high degree has been abandoned for no better reason than the indolence of those left behind when the one efficient man was compelled to relinquish it. In one case I visited

a center that had decided to abandon farther efforts, and found on investigation that a half dozen financially successful courses had been given, with weekly audiences of from 200 to 500 who had followed with great interest the discussions of able men in interesting fields, and that not a dollar had been called for from those who guaranteed to meet any deficit in carrying on this beneficent work. There was money in the treasury and no reason in the world for stopping the work except the indolence and selfishness of human nature. As soon as a new man was found willing to give some of his time and strength, the work went on and has been steadily continued with an unbroken record of prosperity. For reasons given, it has not succeeded more than other centers in getting a large number of real students, but it has been of immense recognized service to the community in the work it has done.

In another community a center with many elements of success was abandoned for lack of a suitable room, though any one of a half dozen churches would gladly have furnished desirable quarters. We ourselves advise, where practicable, to avoid anything that might be construed as associating the work with any one sect or party ; but certainly if no other room is available the work could be carried on and the public could be kept from misunderstanding by meeting sometimes in one church and sometimes in another, or by a distinct announcement that it was a general work connected in no way with the individual church which simply generously contributed its rooms.

We come back constantly to our original proposition that the free public library is the natural center for all the educational work done outside the ordinary teaching institutions. The extremists a half dozen years ago were bound to take a part for the whole and to look upon the extension lectures as covering the whole field. The regents have from the first steadily maintained that this was only one of a half dozen allied agencies of which the public library was the chief, while museums, study clubs, summer schools, evening classes, correspondence teaching and other factors had perhaps an equal place with the extension lectures. These courses if they consist of lectures only are simply another variety of the old lyceum work with improvements shown by experience to be desirable. They deserve high rank as an educational movement only when the

course includes not only the lecture but the carefully prepared syllabus, the guided reading, the classes, clubs, written work and examinations which round out the real educational character of the movement. In many centers in spite of the repeated warnings in our publications, they have gone forward with the lecture or the lecture and syllabus alone, fondly imagining that they were doing extension work and foolishly estimating its success by the number of tickets sold, exactly as they would for church fairs, amateur theatricals or other mere entertainments.

Every community large enough to make a village ought to consider the public library as essential as is the public school to its satisfactory corporate existence. Extension work can be carried on successfully only when there are competent and reasonably permanent workers. It must have some form of public support, for no educational or philanthropic movement goes on indefinitely when wholly dependent on passing round the hat. After a few years even its best friends tire of their contributions and it gradually falls to pieces. The state has passed laws which fully recognize the importance of this side of education. Our public libraries department, with the traveling libraries, pictures and other features, is better adapted than any similar organization for guiding and assisting such work. The regents ought to recognize in their ordinances and encourage by their advice the direct and active support by public libraries of these closely allied agencies. Suitable pictures on the walls or used with the lantern on screens or bound in volumes are just as much an agency for education as is the printed book, and I am convinced that within a few years this fact will be generally recognized throughout the country and that library trustees will be expected by their communities to afford more direct and practical assistance to every study club, extension center or other organized effort for promoting general education among the people who from age or circumstances can not study in the established teaching institutions.

The experience of five years shows that where circumstances permit it, the best results are obtained when extension lecture courses are grouped with other extension agencies into an institute which can utilize its resources for the benefit of all. In England,

the university extension colleges established under direction of Oxford and Cambridge, are in distinct recognition of this principle. In this state, however, institutes emphasize class and club work with libraries and laboratories rather than the extension lecture place. As the methods of both the New York and the English institutions become perfected, it is probable that all the extension agencies will be strengthened and facilities for their employment improved, so that any one may not only find instruction in any subject, but in the way which is most helpful to him and best adapted to his personal needs.

In reviewing the year's work as a whole, I am satisfied that we are making substantial progress in the right direction and that we have reason to congratulate ourselves on the plan of work adopted and consistently adhered to by the extension department of the University of the State of New York.

Respectfully submitted

MELVIL DEWEY, *Director*

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1873	MARTIN I. TOWNSEND, LL. D.	-	-	-	-	Troy	
1874	ANSON JUDD UPSON, D. D., LL. D.,	-	-	-	-	Glens Falls	
1877	CHAUNCEY M. DEPEW, LL. D.	-	-	-	-	New York	
1877	CHARLES E. FITCH, M. A.	-	-	-	-	Rochester	
1877	ORRIS H. WARREN, D. D.	-	-	-	-	Syracuse	
1878	WHITELAW REID, LL. D.	-	-	-	-	New York	
1881	WILLIAM H. WATSON, M. D.	-	-	-	-	Utica	
1881	HENRY E. TURNER	-	-	-	-	Lowville	
1883	ST CLAIR MCKELWAY, LL. D.	-	-	-	-	Brooklyn	
1885	HAMILTON HARRIS, LL. D.	-	-	-	-	Albany	
1885	DANIEL BEACH, LL. D.	-	-	-	-	Watkins	
1888	CARROLL E. SMITH	-	-	-	-	Syracuse	
1890	PLINY T. SEXTON	-	-	-	-	Palmyra	
1890	T. GUILFORD SMITH, M. A., C. E.	-	-	-	-	Buffalo	
1892	WILLIAM CROSWELL DOANE, D. D., LL. D.	-	-	-	-	Albany	
1893	LEWIS A. STIMSON, M. D.	-	-	-	-	New York	
1894	SYLVESTER MALONE	-	-	-	-	Brooklyn	
1895	ALBERT VANDER VEER, M. D., Ph. D.	-	-	-	-	Albany	

One vacancy

Elected by the regents

1888	MELVIL DEWEY, M. A., <i>Secretary</i>	-	-	-	Albany
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REGENTS STANDING COMMITTEE ON THE STATE LIBRARY 1896

ST CLAIR MCKELWAY, *Chairman*

CHANCELLOR

CHARLES E. FITCH

GOVERNOR

WHITELAW REID

CHAUNCEY M. DEPEW

PLINY T. SEXTON

STATE OF NEW YORK

No. 47

IN SENATE

February 5, 1897

79TH ANNUAL REPORT

ON THE

NEW YORK STATE LIBRARY

To the Legislature of the State of New York

I have the honor to submit herewith, pursuant to law, as the 79th annual report of the regents of the University on the New York state library, the report of the director with appendixes.

ANSON JUDD UPSON

Chancellor

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New York State Library

REPORT OF DIRECTOR, 1896

To the Regents of the University of the State of New York

I have the honor to report as follows for the year ending September 30, 1896.

For convenience in comparing reports for various years, a regular outline is followed and comments are grouped under the heads staff, finances, publications, general library (with its law, education, medical and manuscript divisions) acquisition, use, preservation, Library school, and duplicate division. Sub-heads of each topic are shown in the table of contents.

STAFF AND EMPLOYEES, OCTOBER 1, 1896

This list includes all employed for either whole or partial time, and for evening, holiday and vacation opening, not only in the state library proper, but also in the duplicate division, bindery, and in the law, medical and education libraries. The total monthly rates are therefore greatly in excess of the actual monthly payments, as will be seen by comparison with salary payments for the year. The entire force is seldom, if ever, on duty during any one month. This is fully explained in the report for 1892, p. 12. New appointments during the year are shown by a star prefixed, and all promotions are shown in the right hand column. Date of first entering service, name, position, present salary and increase (if any) for the coming year, are as follows.

The following abbreviations for months are used in all tables:

Ja	January	Ap	April	Jl	July	O	October
F	February	My	May	Ag	August	N	November
Mr	March	Je	June	S	September	D	December

e. g. Dec. 12, 1888, is written 12 D 88.

Appointed	State library	Monthly salary for 1896	Increase for 1897
12 D 88	Melvil Dewey, M. A. (Amherst), <i>director</i>	Paid in administrative dep't	
8 Je 68	Stephen B. Griswold, <i>law librarian</i>	\$166	67
1 Ap 89	Walter S. Biscoe, M. A. (Amherst), <i>senior librarian</i>	200	00 ^a
15 F 72	George R. Howell, M. A. (Yale), <i>archivist</i>	166	67
1 Jl 83	Dunkin V. R. Johnston, M. A. (Hobart), <i>reference librarian</i>	166	67
1 Ap 89	Salome Cutler Fairchild (Mt. Holyoke) B. L. S. (N. Y.), <i>vice-director Library school</i>	Paid in examination dep't	
1 Ap 89	Florence Woodworth, <i>director's assist- ant</i>	125	00
1 Ap 89	May Seymour, B. A. (Smith) <i>sub-libra- rian</i> (education)	Paid in administrative dep't	
14 Jl 80	Harry E. Griswold, <i>sub-librarian</i> (law)	100	00
1 S 95	E. Dana Durand, Ph. D. (Cornell) <i>sub-librarian</i> (legislation)	100	00
1 Ap 89	Ada Alice Jones, <i>head cataloguer</i>	100	00
14 Jl 91	Ada Bunnell, B. L. S. (N. Y.) <i>classifier</i> ..	80	00 \$3
15 Ap 89	Judson T. Jennings, <i>shelf-curator</i>	65	00 10
1 O 93	Mary E. Hawley, <i>cataloguer</i>	65	00 5
1 O 92	Charlotte S. Fearey, <i>cataloguer</i>	60	00
8 Je 91	Mary L. Sutliff, <i>shelflister</i>	60	00 5
2 F 92	Dora Schlesinger, <i>accession clerk</i>	50	00 5
1 O 94	Jenny L. Christman, B. S. (Iowa agric.) B. L. S. (N. Y.) <i>cataloguer</i>	60	00
1 Ag 94	Herbert W. Denio, M. A. (Middlebury), <i>assistant</i>	55	00 5
*3 Jl 96	Charles A. Flagg, B. A. (Bowdoin) <i>assistant</i>	50	00
*8 Jl 96	Isabel E. Lord, <i>assistant</i>	50	00
1 Ja 94	Minnie E. Budd, <i>catalogue-curator</i>	50	00 10
17 Ag 91	Harriet A. Chapman, <i>stenographer</i>	50	00 5
28 F 95	Oscar F. Treder, <i>loan clerk</i>	30	00 5

^a \$1500 paid from medical library appropriation and \$900 paid from state library appropriation.

Appointed	<i>Sub-cataloguers</i>	Monthly salary for 1896	Increase for 1897
11 J1 92	Minne Sennett	\$40 00	\$5
O 1 92	Ellen F. Sands	40 00	5
1 Mr 94	Anna B. Sennett	35 00	5
6 Mr 94	Martha H. Vane.....	30 00	5

	<i>Junior clerks</i>		
1 Je 94	Z. Francis Shafer	\$35	\$5
25 Je 94	Howard A. La Moure.....	30	5
29 O 94	George T. Waterman.....	30 ^a	5
1 Ag 95	Grace M. Frost	20 ^b	5
*24 F 96	Joseph Gavit	20	5
*18 Mr 96	Louise M. Boutelle	20	

Total monthly rate for past year.....	\$2,140 01	\$95
Actual salary payments for 1896.....	22,325 37	

	<i>Bindery</i>	Paid during 1896	Wages per week
9 Je 90	Walter Roche, <i>foreman, gilder and letterer</i>	\$1,040	\$20
3 N 90	H. De Rouville, <i>forwarder</i>	682	12
6 Ap 91	James De Rouville, <i>sub-forwarder</i> ...	382 50	7 50
4 Ap 92	Anna J. Keeler, <i>sewer</i>	286	6
*10 F 96	Frank J. Markey, <i>apprentice</i>	195	5
5 F 95	Anna M. Burns, <i>apprentice</i>	185 50	4 ^c
Actual payment for 1896.....		\$2,776 50 ^d	

VACANCIES BY RESIGNATION, DEATH OR TRANSFER 1 OCT. 1895-30 SEPT. 1896

Name and position	began	Service ended	Salary
tr Charles W. Reynolds, <i>loan clerk</i>	20 Je 94	13 Ja 96	\$360
r Fannie M. Wensley, <i>sub-cataloguer</i> ...	22 Ja 92	1 Ag 96	480
l Chester A. Utter, <i>page</i>	1 Ja 91	1 Ag 96	660
l Ellen D. Biscoe, <i>sub-cataloguer</i>	1 O 95	1 J1 96	660
l Anna H. Rogers, <i>junior clerk</i>	20 F 96	1 S 96	240
l Joseph O'Brien, <i>junior clerk</i>	13 J1 93	1 S 96	480
			\$2820

* Appointed since last report.

^a \$5 increase 1 Ap 96.^b Paid from library school fees.^c \$1 increase 1 Mr 96.^d Includes \$5.50 paid M. Flannigan 30 N 95, who took A. J. Keeler's place for one week.

l Absent on leave.

r Resigned.

tr Transferred from another dep't.

tr Transferred to state board of charities.

EXPENSES

State library

	1892	1893	1894	1895	1896
Books	\$8,384 47	\$9,504 16	\$8,657 30	\$8,923 25	\$8,220 06
Serials	1,694 59	2,362 15	2,240 85	2,415 69	2,123 30
Binding	3,266 84	3,817 19	5,501 21	4,217 66	4,658 58
	<u>\$13,345 90</u>	<u>\$15,683 50</u>	<u>\$16,399 36</u>	<u>\$15,556 60</u>	<u>\$15,001 94</u>
Fittings	\$321 76	\$1,928 02	\$931 42	\$1,001 95	\$1,207 03
Supplies	208 13	508 18	849 52	753 37	65 23
Printing	1,260 47	201 98	430 24	378 78	193 69
Travel	101 32	11 89	.....	39 54	.....
Repairs	198 25	82 57	172 25	524 93	70 05
Incidentals	331 18	123 03	939 86	172 90	91 15
	<u>\$2,421 11</u>	<u>\$2,855 67</u>	<u>\$3,323 29</u>	<u>\$2,870 45</u>	<u>\$1,627 15</u>
Salaries	<u>\$20,860 04</u>	<u>\$18,810 76</u>	<u>\$20,663 37</u>	<u>\$21,355 45</u>	<u>\$22,325 37</u>
Totals	<u>\$36,627 05</u>	<u>\$37,349 93</u>	<u>\$40,386 02</u>	<u>\$39,782 50</u>	<u>\$38,954 46</u>

Public libraries

	1894	1895	1896
Books	\$9,461 06	\$10,021 10	\$5,820 09
Binding	24 15	188 00	.....
	<u>\$9,485 21</u>	<u>\$10,209 10</u>	<u>\$5,820 09</u>
Fittings	\$385 42	\$604 14	\$360 74
Supplies	31 15	48 95	83 98
Printing	752 16	915 01	428 13
Travel	238 38	480 30	379 93
Incidentals	a 141 17	256 82	318 70
	<u>\$1,548 28</u>	<u>\$2,305 22</u>	<u>\$2,071 48</u>
Salaries	<u>\$3,686 68</u>	<u>\$5,133 99</u>	<u>\$7,084 00</u>
State grants to free libraries	<u>\$10,101 92</u>	<u>\$12,317 22</u>	<u>\$15,828 25</u>
Totals	<u>\$24,822 09</u>	<u>\$29,965 53</u>	<u>\$30,803 82</u>

There was also expended for the medical library \$4,318.06: \$2,176.40 for books, \$18.75 for fittings, \$622.91 for serials, \$1,500 for salaries.

a Includes \$1.85 for repairs.

PUBLICATIONS

Many publications of direct library interest which in other states would be issued by the state libraries or commissions are in this state issued by the extension department of the University. In this are grouped all the agencies for the extension of facilities for 'extra-mural education' of which the library, local or traveling, is the strongest factor and the natural center. The syllabuses are of special value to libraries, as each contains a select bibliography which the author considers the best on the phase of the subject that he treats. A list of the extension syllabuses and also of the bulletins of the year is therefore given below.

Extension department

<i>Extension bulletins</i>			
10 Extension of University teaching.....	2000	108	15c.
12 Extension report, 1894.....	2000	66	10c.
11 Study clubs bulletin.....	2000	228	25c.
13 Summer schools.....	2000	98	10c.
14 Books recommended for school libraries.....	2000	86	5c.

Syllabuses

57 Jackson, A. V. Williams. Persia (lectures 1-3, 6-10)....	200	8	.....
58 Scott, W. B. Zoologic geography.....	500	14	5c.
59 Mills, Herbert E. The labor problem.....	500	42	10c.
60 Rice, Richard A. America and Europe in the 18th century.....	500	12	5c.
61 Goodyear, W. H. History and criticism of the Italian art and of painting by the old masters.....	1500	18	5c.
62 McMurtry, F. M. Pedagogy.....	500	18	5c.
63 Dunning, W. A. European history since 1815.....	1000	28	10c.
64 Parmele, Mary Platt. Music.....	500	14	5c.
Reprints of syllabuses, 26, 54, 11.....	2000	62	.....

Public libraries division

Traveling library finding lists; annotated

2 Miscellaneous lists, 50 books each.....	5000	28	2c. ea.
1 Young people's library list 25 books.....	2000	8	2c. ea.
List covering regents U. S. history reading courses.....	1500	8	2c.
Reprints of 9 miscellaneous lists and lists on French history, U. S. history, economy and agriculture.....	16000	192	2c. ea.

PRINTING SUMMARY

	1894		1895		1896	
	No.	Copies	No.	Copies	No.	Copies
Books, bulletins and handbooks						
State library.....	2	7,000	4	7,700	1	2,000
Public libraries.....	19	35,000	30	78,500	18	24,500
Library school.....			1	5,000		
Blank forms, not including stationery						
State library.....	25	33,650	19	15,800	25	38,100
Public libraries.....	22	24,025	19	26,300	17	47,900
Library school.....	7	3,400	2	1,200	7	2,400
Circulars						
State library.....	3	1,400	12	4,400	7	3,100
Public libraries.....	21	19,600	10	8,300	14	23,000
Library school.....	4	1,900	9	2,900	4	200
Total.....	103	125,975	106	150,100	93	141,700

Comparative legislation. The legislative bulletin issued separately and included each year in the library report continues to be found increasingly useful by those interested in comparative legislation in all parts of the world. Every year numerous students of public affairs learn for the first time the practical value of the publication and bear witness to the service it renders in making better statutes not alone in New York but in other states. In the library is the full text of the laws indexed, besides a supplementary manuscript index to date of new statutes as fast as early copies can be secured from each state. Besides the statutes of all the states and of many foreign countries, several thousand carefully selected volumes on political and sociologic subjects have also been added to meet the practical wants of the legislature.

LAW DIVISION

The law library, which includes not only the books classified in the tables as law, but allied subjects constantly used in connection with them, grew during the year from 53,916 volumes to 55,948. 817 of these new books were bought and 1215 were gifts or exchanges. No less than 1607 of these additions were continuations of sets already on the shelves. Our library is holding its own as the best general law library in the country.

Among the most important additions are:

- Georgia. Colonial acts 1755-74. [Reprint 1881] 1 v.
- Indiana. Constitutional convention proceedings 1816. 1 v.
- Kansas. Constitutional convention proceedings 1859. 1 v.
- Macassey's New Zealand reports. 1 v.
- Natal law reports 1873-94. 13 v.
- New Hampshire. Laws 1794-1810. 14 v.
- New South Wales. Laws 1824-69. 5 v.
- New Zealand. Compiled statutes, ed. of 1892. 4 v.
- New Zealand jurist. 6 v.
- North Carolina. Laws 1810, 1819, 1821. 3 v.
- Post's Kip's Bay farm abstracts, N. Y. city. 3 v.
- Queensland. Compiled statutes, ed. of 1894. 6 v.
- Rhode Island. Acts and resolves 1776-77, 1779-82, 1784, 1788-89, 1792-93, 1796-97. 13 v.
- Rhode Island. Digest of laws 1705. [Reprint 1896] 1 v.
- South Australia. Laws 1857-91. 11 v.
- Straits law journal. 5 v.

Straits settlements law reports. 2 v.

Tasmania. Compiled statutes, ed. of 1890. 5 v.

U. S. income tax cases. Complete collection of records, arguments, etc., before U. S. supreme court. 2 v.

Victorian law times. 2 v.

EDUCATION DIVISION

The largest use of this division is by the examination department which constantly calls for catalogues and circulars of information of various institutions to determine the claims of their students for law, medical, dental and veterinary student certificates without which no one can now enter on the study of these professions in New York state. Effort is made to collect as complete sets as possible of publications giving information regarding the scope and character of instruction in fitting schools and colleges both at home and abroad.

The division now contains 4190 bound volumes, 284 of which were added this year, 85 as gifts. A gift of 2651 pamphlets was received from the United States bureau of education, and of 2319 pamphlets from other sources, making a total of 4970.

MEDICAL DIVISION

With the new appropriation which became available at the beginning of the past fiscal year, 1116 volumes have been added and also many American and foreign periodicals. The total number of volumes in this division is now 6856 with 4806 subject cards in the catalogue. Growth for the next year will be retarded because of the smaller appropriation, which is only \$3500 instead of \$5000 as for the first year.

MANUSCRIPT DIVISION

The archivist, George R. Howell reports as follows for his division :

By the instruction of the director all letters applying for information as to the military service of the citizens of the state of New York in the revolutionary war were referred to me for answer. Besides these I have had almost daily one or more similar inquiries referred to me from the office of the secretary of state. The various patriotic societies demand a reference to the original manuscript by volume and page for authority of the certificate and accordingly this has to be found and made part of the certificate. About 260 such certificates have been sent during this year. These certificates differ in so many points from each other that the use of a printed blank form would be impracticable. Since March 31, 1896, I have written about 660 letters on these or such other library business as fell to me. I have sent out about 60 requests for genealogies, and it is a satisfaction to say that the returns from these letters amply repaid the time spent in preparing them. This work has occupied

nearly all my time. What little time I have had after attending to these I have spent in indexing the manuscripts. I should add that I am called from my work not unfrequently by people who ask to see me personally for assistance in their search for information in the library.

Since fall set in, the demand for military certificates has been a little less frequent, but still for the greater part of the time since Oct. 1 I have had to use part of the afternoon, my own time, in making searches or preparing certificates. This I have done in order to keep abreast of the correspondence. My familiarity with this work enables me to say that it is impossible for any human being working alone to do all that is necessary in this department and keep up with the work as it comes, while devoting only half the usual day's work to the business. I have been looking for a decided falling off in the calls for military certificates, but it has not yet come except to a small degree.

I recommend that no book be permitted to be taken out of the mss. room for consultation till the applicant has signed a card giving the name of the book required and the date of its use. Otherwise there is no means of tracing the source of loss of any of the volumes that are taken out for readers by pages at any hour of the day or night.

ACQUISITIONS

As the state library constantly draws on the extension and traveling libraries for its readers and as no part of the state collection is of greater practical service than these books which find their way to the remotest districts, they must be included to show correctly the resources of the state library, though for convenience they are administered by the extension department.

GROWTH 1898-96	TOTAL VOLUMES IN LIBRARY				ADDED 1896		
	Oct. 1 1893	Oct. 1 1894	Oct. 1 1895	Oct. 1 1896	Gifts, ex- changes and bind- ing	Bought	Total
General library.....	122,486	130,562	136,510	142,542	3,799	2,233	6,032
Law division.....	49,668	52,231	53,916	55,948	1,215	817	2,032
Traveling libraries..	5,946	14,121	20,865	27,027	.....	6,162	6,162
Duplicates.....	75,808	76,575	77,860	79,152	.....	.....	1,292
Total.....	253,908	273,489	289,151	304,669	5,014	9,212	15,518

The library has grown from 190,426 volumes reported last year to 198,490 in the state library proper, with 27,027 volumes in the traveling and extension libraries and 138,072 duplicates, including both bound and unbound, bringing the grand total up to 363,589. This total is based on an estimate of the duplicates on hand in 1889 as 100,000 and that of these 70,000 were bound and 30,000 unbound. To these estimates have been

added from year to year the exact duplicate accessions, giving an appearance of accuracy to numbers which are really only approximate. When an actual count can be made it will necessarily vary from these figures, probably exceeding them, though under all the disadvantages of inaccessibility and inconvenience in handling, there is a steady outgo in sales and exchanges.

The additions of the year were 20,042. Of these only 3050 volumes and 50 pamphlets were bought. 5014 volumes and 11,934 pamphlets came in by gifts and exchange, including 1114 volumes made by binding pamphlets and 960 by binding serials. This is a remarkable record for a state library, which usually receives a much smaller proportion of gifts than the ordinary public or college library.

The present composition of the library is shown in detail in classified summaries where under each of the 100 main divisions of the library are given the total volumes now on hand, the number added during the year, with their cost, the cost of serials in that subject for the year, and also the total subject cards and the number added for the year. Such a table enables any one interested to study the development of the library and is a protection against the one sided growth that sometimes takes place without any of the responsible officers realizing the facts. This constitution of the library is shown in the 10 main classes as follows:

	VOLUMES			Serials cost	SUBJECT CARDS	
	Total	Added	Cost		Total	Added
General works	17,373	528	\$260 00	\$538 78	4,972	596
Philosophy	1,858	68	50 91	28 92	1,087	113
Religion	12,839	711	225 91	53 36	3,647	605
Sociology	28,175	2,926	4,725 94	1,065 20	12,442	995
Philology	2,640	99	46 40	22 16	1,200	192
Nat. science	10,535	539	478 09	268 25	8,193	658
Useful arts	18,179	1,614	2,607 66	616 42	6,861	1,085
Fine arts	2,684	178	456 64	62 85	1,844	524
Literature	19,075	481	185 60	10 98	10,572	5,245
History	35,892	986	1,652 33	183 95	31,605	3,039
Total	142,095	8,064	\$10,689 48	\$2,840 82	62,373	18,052

The figures in the six columns above are made up as follows: the library was roughly classified at the time of its reorganization in 1889, and the count of the shelf list or inventory showed the volumes in each of the 10 classes. Each year the accession book shows the number added to each class and the total of the first column is made by adding the additions of the year to the total of the previous year. The second column is an exact count from the accession book from October 1 to

September 30 of each year and the third column gives the actual cost of these additions as recorded in the accession book. The fourth column is taken from the serial clerk's records and is the total paid for subscriptions for the serials for the year in each subject, but does not include the cost of binding nor does it include the back volumes bought to complete sets which are put on the accession book and included with the volumes added. The fifth and sixth columns are made up like the first and second, the sixth being the accurate count returned by the curator of the card catalogues of the number of new cards put in each year. This is added to the total of the previous year made originally by actual count of the cards in the catalogue. The only discrepancy will be for the occasional cards consolidated or withdrawn. The great discrepancy of the table appears in the first column where we show a total of over 50,000 volumes less than our general statistics. This is because our great law library including the books on political science and administration, has not yet been incorporated in the regular card catalogues or in the totals for sociology, which would be swelled to over 80,000 volumes. This field, however, is the one that most vitally concerns the state and our most careful attention is given to the development of these subjects of practical utility to the various departments of the state government.

Our library, as might be expected, outside its specialty of sociology, has most volumes in history, which is very closely allied. Our large medical library of 6856 volumes, and that of agriculture, 2402, brings up the total of the useful arts to 18,179. This is a field seldom well represented in local libraries and we therefore feel it doubly important to have all needed books available at Albany, so that the local libraries when necessary can borrow them for temporary use.

Woman's library. At the World's Columbian exposition the most complete exhibit of books written by the women of any state was made by the women managers of New York, who by persistent effort gathered 2500 volumes. These represented the work as authors, editors, translators, etc. of women either natives or sometime residents of the Empire state. At the close of the exposition this collection was given to the state library as the nucleus of a permanent and growing exhibit of the literary activity of New York women, and is separated from the rest of the library as a distinct section. For carrying out this plan its promoters must depend on the interest and cooperation of writers and publishers entitled to representation, as there is no fund that can be used for this purpose.

The library strives to make this a complete exhibit of the literary work of New York women by sending this statement coupled with the following request to every new author in this field and to all older writers not fully represented.

(Request)

Of your works we now have ^{those named on the next page.}
_{none.}

Will you not contribute whatever is necessary to a complete exhibit of your literary work?

Packages may be sent by express unpaid, or stamps will be sent to prepay postage on notice of the amount. Please address with the inclosed label so that the wrapper shall show clearly that the books are for this special collection and not for the general library.

Order department. 1227 orders were sent to agents, making with the 494 orders outstanding Oct. 1, 1895, a total of 1721; 1062 orders were filled and 38 canceled, leaving 621 orders outstanding Oct. 1, 1896. These figures do not include the much larger orders for traveling and extension libraries in the public libraries division, or those sent to auction agents. These are not placed on the order book, but press copies are taken of traveling library orders and the sale catalogues serve as a record of auction bids. A large number of books are also bought, without orders, from the weekly shipments of new books sent on approval by our New York agents.

Important additions. The classified statistics on p. 28-29 show compactly and clearly how expenditure has been distributed over the 100 divisions of the library. The following are the most important additions of the year:

General works

Johnson's universal cyclopædia. New ed. 8 v.

Guardian, 1876-81. 11 v.

Bickwell, L. Bucheinbände des 15-18 jahrhunderts

Zimmermann, K. E. Bucheinbände. 2 v.

Religion and sociology

Church journal, 1853-77. 25 v.

Marquardsen & Seydel. Handbuch des öffentlichen rechts. 7 v.

Mass.—Board of education. Annual report, 1864-95. 23 v.

Pangborn, J. G. World's railway

Austria. Costüm ausstellung im k. k. österreichischen museum

Science

Chemical news, 1860-94. 70 v.

Nordenskiöld, G. Cliff dwellers of the Mesa Verde

American microscopical society. Proceedings, 1878-95. 17 v.

Sargent, C: S. Silva of North America, v. 9

Saussure H: de. Etudes sur la famille des vespides. 3 v.

Useful arts

- Buck, A. H: Reference handbook of the medical sciences. 9 v.
 Dictionnaire encyclopédique des sciences médicales. 100 v.
 Archives générale des médecine, 1866-91. 52 v.
 Medical record, 1866-82. 22 v.
 New York medical journal, 1873-93. 27 v.
 American climatological association. Transactions, 1885-95. 10 v.
 Hirschfeld and Léveillé. Atlas of the central nervous system and cranial nerves
 Macewen, W: Atlas of head sections
 Virchow, R. Handbuch der speciellen pathologie et therapie. 9 v.
 Cyclopedia of practice of medicine; ed. by H. von Ziemssen. 20 v.
 Hebra, F. Atlas der hautkrankheiten. 10 v.
 Taylor, R. W: Clinical atlas of venereal and skin diseases. 2 v.
 Deutsche chirurgie. 35 v.
 Archiv für ophthalmologie, 1854-95. 41 v.
 Centralblatt für praktische augenheilkunde, 1877-93 17 v.
 Jahresbericht über die ophthalmologie, 1870-93. 24 v.
 Klinische monatsblätter für augenheilkunde, 1863-95. 33 v.
 American journal of obstetrics, 1868-94. 30 v.
 Engineer, 1856-95. 80 v.
 Engineering, 1866- 60 v.
 Dredge, J. Transportation exhibits at Columbian exposition
 Nye, A. C. Sketches of colonial furniture

Fine arts

- Jahrbuch der kunsthistorischen sammlungen. v. 17
 Anderson, W: Pictorial arts of Japan
 Architectural publication society. Dictionary of architecture. 8 v.
 Longfellow, W: P. P. Cyclopædia of works of architecture in Italy, Greece and the Levant
 Architecture and building, 1886-95. 15 v.
 Soderholtz, E. E. Colonial architecture and furniture
 Wallis, F. E. American architecture, decoration and furniture of the 18th century
 Prisse d' Averages. La decoration arabe
 Turner, J. M. W. Turner gallery, with text by R. N. Wornum

History

- Bien, J. R. Atlas of the state of New York
 Burton, W: Description of Leicestershire, 1777
 Schmid & Meurer. Burgen und schlösser in Österreich
 Ebers, G: M. Aegypten, hrsg. von Max Junghändel
 Oyen, A. A. V. van. Stam- en wapenboek. 3 v.

Woodward J: Treatise on heraldry. 2 v.

Thacher, J: B. Continent of America

Bradford, W: History of the Plimoth plantation

Gift list. As stated in the last report, to secure certain advantages in compactness and convenient reference the experiment will be tried of printing triennially the list of donors with the number and character of their gifts, previously appended to each report. The next will therefore be found in the report for 1897.

UTILIZATION

Catalogue. 36,382 cards have been added to the catalogue; 17,219 author cards, 13,052 subject cards and 6111 title cards.

Open shelves. Several thousand books are on open shelves in the reading rooms for readers to consult at will, but attempts by readers to return books to their places result in many misplacements, causing much inconvenience and loss of time both to readers and attendants. To avert such confusion, the following request is posted conspicuously in the reading rooms.

A book misplaced is practically lost, therefore

Do not return books to the shelves, but leave them on the tables or ledges

so that the library staff may be sure that no error is made in putting them in their places.

Evening use. During the nine months when the library was open evenings there were 5056 readers between 6 and 10 p. m. who called for 8716 volumes from the stacks, besides using many thousand volumes in the reading rooms, of which no record is kept. From Aug. 6 till Oct. 15 the library was closed at 6 p. m. as the number of evening readers was not likely to justify the expense of lighting and service.

Loans. The monthly record of loans shows, as is usual all over the world, the largest circulation in the month of March. By subjects, literature leads with 34%, while history with 24% and sociology with 15% are second and third.

All applications for the privilege of borrowing are now made on the following form, and filed for reference at the loan desk after the applicant has been notified whether his request could consistently be granted.

(Application)

To insure early consideration this blank should give all the items of information asked.

Name

Address

Occupation or position (*with the name of institution or firm*)

Length of time for which permit is needed

Most permits are for temporary privileges during a special investigation. The shorter the life of the permit the more readily it can be granted.

Books or subjects for which this extra privilege is asked

The permit if granted is good *only for books or subjects specified above*. Current literature and fiction, in the state library, are for preservation and reference and are not lent on permits.

The facilities offered by the state library for consulting books from 8 a. m. to 10 p. m. are insufficient for my use, because

If the permit is granted, I agree to comply with all library rules.

(Signed)

I agree to be responsible for any book lent the above applicant, which is not returned in accordance with the rules and without injury beyond reasonable wear.

(Signed)

Before this application can be granted the above guarantee should be signed by a regent, a state officer, or some other responsible person known to the library committee.

As books lent to out of town borrowers have sometimes come back so insufficiently wrapped that bindings were scratched or corners broken, the following directions are pasted on every package of books sent to distant readers.

Books from the state library are lent for temporary use outside Albany only on condition that such precautions be taken in packing as to guard against any probability of injury in transportation.

Therefore please return this book packed the same as when it came.

Protect edges and corners carefully.

Do not roll pamphlets, but send them flat.

MONTHLY RECORD OF LOANS BY CLASS 1896

CLASS	1895			1896									
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total
000 General	111	133	120	91	90	130	124	123	92	103	64	71	1252
100 Philosophy	12	16	16	14	20	18	25	11	9	31	16	18	206
200 Religion	41	32	26	26	33	29	57	41	31	22	13	47	398
300 Sociology	122	142	142	186	155	179	155	141	114	120	99	82	1637
400 Philology	4	10	11	8	20	3	5	3	7	4	7	7	89
500 Science	36	24	21	48	34	61	41	24	13	28	21	19	370
600 Useful arts	8	15	23	19	41	53	27	27	23	22	28	24	308
700 Fine arts	19	11	15	21	28	25	29	15	9	24	15	40	251
800 Literature	265	302	310	418	345	357	311	313	348	304	251	238	3762
900 History	136	181	233	264	280	334	328	206	225	153	131	153	2624
Total 1896	752	866	917	1095	1046	1189	1102	904	871	811	645	699	10897
“ 1895	1028	1217	1034	1237	1313	1445	1157	1031	809	751	636	529	12187
“ 1894	1114	974	1100	1290	1390	1456	1343	1257	1020	656	670	559	12859

Capitol library. During the year ending Oct. 1, 1896, 241 borrowers have been added to the capitol library register, making a total of 668 from the beginning, of whom 345 are still entitled to draw books. During the past year 719 volumes were lent to state library borrowers, who, even when not state employees, may take one volume at a time from the capitol library. In this library also March shows the largest record and 80% of the reading is in literature, history following with 13%. The restriction on the circulation of fiction after the recall of permits in 1895, and their reissue only for specified subjects together with the lack of funds for buying new books, has reduced the circulation and number of readers.

USE OF CAPITOL LIBRARY BY CLASS 1893-96

CLASS	1893		1894		1895		1896	
	Circulation	Percentage	Circulation	Percentage	Circulation	Percentage	Circulation	Percentage
000 General works.....	.....	.....	124	2 34	145	.015	109	01.5
100 Philosophy.....	.....	.....	7	.13	22	.002	14	00.2
200 Religion.....	.....	.....	51	.95	89	.009	23	00.3
300 Sociology.....	28	3.53	97	1.83	158	.016	144	02.1
400 Philology.....	.....	.....	.....	.....	2	.000	2	00.02
500 Science.....	4	.5	49	.91	96	.010	59	00.8
600 Useful arts.....	22	2.77	53	1.	44	.004	33	00.4
700 Fine arts.....	16	2.02	80	1.51	148	.015	91	01.3
800 Literature.....	609	76.80	4119	77 72	7536	.826	5476	80
900 History.....	114	14.38	721	13.61	1130	.119	894	13
Total.....	793	100	5300	100	9420	100	6845	100

PRESERVATION

Binding. In new work our bindery turned out 1683 volumes in half morocco, 150 half duck, 503 cloth, 207 American Russia, or a total of 2543 volumes, which would have cost us at lowest contract prices \$2586.45. Besides this, other work done in the bindery brought the total product up to \$3562.16. The report shows that after allowing 10% for depreciation of machinery, we have made a net gain of \$166.09 for the year, making the total gain since the bindery was started \$428.41, thus proving that we have secured a better quality of work, greater protection against loss by fire, and the convenience of having the books accessible in our building, all not only without loss but with a little actual gain to the state. Detailed statistics are given in the following table and in table B, p. 28-29.

BINDERY ACCOUNT BY SIZE AND MATERIAL OCT. 1, 1895-SEPT. 30, 1896

HEIGHT IN CENTIMETERS NOT EXCEEDING	1/2 GOAT			1/2 DUCK			CLOTH			1/2 AM. RUSSIA			TOTAL	
	Vols.	Rate	Value	Vols.	Rate	Value	Vols.	Rate	Value	Vols.	Rate	Value	Vols.	Value
70.....	....	....	....	....	\$5 20	....	....	....	....	....	....	....	....	....
60.....	....	\$4 00	....	5	3 50	\$17 50	....	....	....	....	....	....	5	\$17 50
50.....	3	2 70	....	6	2 40	14 40	....	....	....	....	....	....	9	22 50
45.....	1	2 25	2 25	23	1 95	44 85	....	....	....	....	....	....	24	47 10
40.....	28	1 90	53 20	41	1 60	65 60	2	\$1 25	\$2 50	....	....	....	71	121 80
35.....	303	1 50	454 50	56	1 25	70 00	20	1 00	20 00	22	1 25	\$27 50	401	572 00
30.....	368	1 20	441 60	19	1 00	19 00	102	75	76 50	64	1 05	67 20	553	604 30
25.....	838	95	796 10	....	....	....	308	60	184 80	88	75	66 00	1234	1,046 80
20.....	116	75	87 00	....	....	....	55	50	27 50	33	60	19 80	204	194 30
17.5.....	24	60	14 40	....	....	....	5	35	1 75	....	....	....	29	16 15
15.....	2	55	1 10	....	....	....	11	30	3 30	....	....	....	13	4 40
Total	1683	....	.....	150	....	.....	503	....	.....	207	....	.....	2543	\$2,586 45

Work in unusual binding materials, or for other reason not included in the table

2 blank books 1/2 morocco, \$3.50; 5 full duck books, \$4.75; 1 1/2 morocco case for map, 55c. Total, \$8.80.
 Value of new binding in table, \$2586.45; value of other binding in table, \$8.80; 10185 lines extra lettering at 3c,
 \$305.55; 10533 gilding class and bk nos. at 3c, \$315.99; 129 new titles at 10c, \$12.90; 75 new backs at 40c, \$30.00;
 540+hours extra work at 50c, \$270.03; 2144+mounts on paper guards at 1 1/2c, \$32.18; 13 mounts on muslin guards at
 2c, 26c. Grand total, \$3562.16.

DUPLICATE DIVISION

Exchanges. The following volumes and pamphlets have been sent in the past five years from the library under the system of exchange to American and foreign states and territories and to various institutions in this and other countries :

	1892	1893	1894	1895	1896
Court of appeals reports	308	220	184	138	184
Supreme court reports.....	210	252	301	301	516
Session laws	140	128	144	....	153
Legislative journals and documents	2312	.....	2660	2940	.....
Legislative manual.....	44	44	44	44	44
State library reports	301	127	474	350	.....
State library bulletins	1636	428	1837	1975	1125
State museum reports.....	212	339	480	668	....
State museum bulletins.....	1675	271	655	770	300
U. S. N. Y. regents reports.....	1404	1013	2890	....	1800
U. S. N. Y. examination reports.	....	....	....	....	700
U. S. N. Y. extension reports....	....	....	....	....	750
U. S. N. Y. regents bulletins....	2341	3185	8758	2384	3340
U. S. N. Y. examination papers..	430	490	510	550	650
Other volumes and pamphlets...	160	514	225	1416	750
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	11,173	6911 ^a	19,162	11,536	10,312
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

LIBRARY SCHOOL

The register of the first 10 years of the Library school appended to the report will be a revelation to those who have not watched the development of professional training for librarians. Our school was the first of the kind in the world. Those familiar with the subject say that there has never been a professional school established that has had so remarkable a history in the demand for the service of its graduates and in the extent to which they have taken a leading part in the best work of the country in its first decade. Lack of room to accommodate more than 30 students at a time has compelled us to adhere to the principle of keeping the numbers down and has done much to encourage the formation of library training classes at Pratt institute in Brooklyn, Drexel institute in Philadelphia and Armour institute in Chicago, and as a part of the summer schools at Amherst college and the University of Wisconsin, not to

^a This small total is due to the wholesale destruction by the burning of the state printer's office in 1892 of publications which would have been distributed in 1893.

mention a half dozen universities or libraries where regular instruction to a limited extent is given in library economy.

Classes for 1896. The fall term opened Wednesday Oct. 2, with 30 students representing 10 states as follows :

STATES	Senior	Junior	Total
New York	6	9	15
Massachusetts .....	.....	5	5
Connecticut .....	.....	3	3
District of Columbia .....	.....	1	1
Iowa	1	.....	1
Maine .....	.....	1	1
Maryland	1	.....	1
New Jersey .....	.....	1	1
Pennsylvania .....	.....	1	1
Rhode Island	1	.....	1
	9	21	30

The colleges represented are: for men only, Amherst and Bowdoin colleges; for women only, Wellesley, Smith, Vassar, Mt Holyoke, Wells and Elmira colleges; for coeducation, Cornell university, University of Michigan, Alfred university, Swarthmore college and Iowa agricultural college.

Of the 21 members of the junior class, 13 were admitted without examination as holders of college degrees. The remaining eight passed entrance examinations in general literature, general history, general information, German and French; 10 other candidates who were admitted to the examination failed.

Examinations and credentials. The usual library examinations were held in March and June. 284 examination passcards were issued; 215 teacher's passcards, seven certificates on completion of one year of work, three diplomas and two degrees. Degrees and diplomas were conferred on the class of 1896 as follows:

Degree of B. L. S.: Myrtila Avery, Nancy May Pond.

Diplomas. Ellen Dodge Biscoe, Waller Irene Bullock, Frances Jenkins Olcott.

Annual visit. The school visited the libraries of Boston and vicinity, Hartford and Springfield March 31-April 10, and attended a meeting of the Massachusetts library club.

Admission to senior class. An important change of policy was made in June, to go into effect the following school year, by which the completion of junior work will not hereafter necessarily admit to the senior class. Class work, examinations, and those personal qualifications which make or mar success will be weighed and only those who seem likely to render important service in the library profession will be received for the second year.

Summer session. The first summer session of the New York state library school began July 7, and lasted five weeks. After their very heavy year's work the regular faculty could not undertake detailed instruction of the summer class, though they gave certain lectures. The direct conduct of the school was in charge of Miss Myrtilla Avery, B. L. S. 1896, director's assistant in the public libraries division, assisted by Miss Elisa May Willard, reference librarian at the Carnegie library, Pittsburg, who from their library course and experience seem best adapted to this peculiar work. This summer faculty had every facility of the school and efficient assistance. At the close of the course regents examinations were given, and certificates stating that the summer course had been completed were awarded to 14 successful candidates, four of whom passed with honor, or above 90%. Students had free use of the state library as well as of the library museum and other collections belonging to the Library school. Obviously a five weeks' course allowed study only of the simplest methods and most elementary work of the 70 weeks of the full course, and included simple cataloguing, classification, accessioning, shelving, loan systems and some elementary work in bibliography and library economy.

As this summer course was given at the urgent request of library assistants who could not leave their positions for the full course, they had preference, and only those who held credentials for the completion of a full four-year academic or high school course or its equivalent, were admitted. Of the 20 students admitted for regular work and two for partial work, all but one were engaged in library work and 10 were in New York libraries. Those engaged in library work in New York state were instructed without charge as part of the work of the public libraries division, but to all others a fee of \$20 was charged.

The practical success of the school amply justified this unusual effort to provide instruction for those who can not take the time for the two years' course.

Faculty. The only change in the faculty is the addition of the public libraries inspector, William Reed Eastman, M. A. (Yale), B. L. S. (N. Y.), as lecturer on library buildings.

List of students, 1896. The classes for the year were :

Seniors

Avery, Myrtila, Katonah, N. Y. B. A. Wellesley college, 1891
 Betteridge, Grace Lillian, Brockport, N. Y. Wellesley college, 1887-89
 Biscoe, Ellen Dodge, Albany, N. Y. Wellesley college, 1885-88
 Bullock, Waller Irene, Baltimore, Md. Wellesley college, 1892-94
 Corwin, Euphemia Kipp, Greendale, N. Y.
 Crawford, Esther, Missouri Valley, Iowa. B. L. Iowa agricultural college, 1887
 Curtis, Florence Rising, Ogdensburg, N. Y. Wells college, 1891-94
 Olcott, Frances Jenkins, Nassau, N. Y.
 Pond, Nancy May, Woonsocket, R. I. B. S. Wellesley college, 1893

Juniors

Abbot, Etheldred, Utica, N. Y. B. A. Vassar college, 1895
 Ames, Anne Seymour, Washington, D. C.
 Andrews, Elisabeth Parkhill, Wethersfield, Ct.
 Atkinson, Jane, Holicong, Pa. B. A. Swarthmore college, 1893
 Fellows, Jennie Dorcas, Norwich, Ct.
 Flagg, Charles Allcott, Sandwich, Mass. B. A. Bowdoin college, 1894
 Frisbee, Edward Selah, Albany, N. Y. B. A. Amherst college, 1860 ;
 M. A. 1866 ; D. D. 1878
 Hopkins, Julia Anna, Palmyra, N. Y.
 Iles, Constance Hurford, Providence, R. I. B. L. Smith college, 1895
 Kueffner, Cecilia Wanda, Cambridge, Mass. University of Michigan, 1892-93 ; Radcliffe college, 1893-94
 Langworthy, Louise, Alfred, N. Y. Ph. B. Alfred university, 1895
 Lord, Isabel Ely, Essex, Ct.
 McNair, Mary Wilson, Oneida, N. Y. B. A. Elmira college, 1895
 Morse, Anna Louise, Millbury, Mass. B. A. Smith college, 1892
 Newman, Alice, Pittsfield, Mass. B. S. Wellesley college, 1893
 Pierson, Harriet Wheeler, Florida, N. Y. Mt Holyoke college, 1892-94
 Smith, Bessie Sargeant, Wellesley, Mass. B. A. Wellesley college, 1895
 Terwilliger, Mary Sayers, Alfred, N. Y. Ph. B. Alfred university, 1890 ;
 Ph. M. 1892
 Thompson, Madeleine Sylvester, Passaic, N. J. B. S. Cornell university, 1882

Thorne, Elisabeth Gertrude, Skaneateles, N. Y. B. A. Vassar college,
1895

Waterman, Lucy Dwight, Gorham, Me.

Willard, Julia Etta, Watertown, N. Y. B. L. Cornell university, 1885

Positions filled. 64 positions have been filled during the year by graduates and students as shown in the 10-year summary. See p. 33.

Private instruction. Beside those instructed in the school the following special personal instruction was given as follows:

Jan. 3-Feb. 29, 1896. Irene Earll, Central library, Syracuse, N. Y. .

Mar. 3-14, 1896. Mary E. Miller, Engineering news publishing co.
Tribune b'ld'g, New York

Aug. 11-31, 1896. Anna B. Miller, St Agnes free library New York

Sept. 12-15, 1896. Helen Moore, University settlement library New
York

The use of the library has been rapidly increasing ever since the reorganization of the University in 1889. It is no longer possible to meet adequately the demands of the public without an increase in the appropriations, which have remained the same as they were fixed seven years ago when the work was so much less. As a result of this unusual pressure we have been forced to cut expenditures below our needs on every item. The summary of expenses on page 10 shows that five of the six items are the lowest since records have been kept. While the items for salaries are the largest, the need of more help has never been felt so much. With our growing usefulness there are new demands for time and work that ought to be met. If those who make the appropriations could know in detail how carefully they are expended and the amount of practical good that comes to the state's higher interests, we should not be compelled to suggest a second time a reasonable increase to correspond somewhat with the increased work. It is a common remark of those who take time to familiarize themselves with the work of the library, that no department of the state's government has made more satisfactory progress or better deserves the sympathy and practical support of the legislature. I am compelled to recommend that the necessity of increased funds be urgently represented to the next legislature.

Respectfully submitted

MELVIL DEWEY

Director

State library, Albany, N. Y. 17 Dec. 1896

APPENDIX I: SUMMARY OF STATE LIBRARY

A Additions	TOTAL	1893		
	1893	Oct.	Nov.	Dec.
Bought				
From regular agents.....	2310	150	206	174
From auctions.....	77	-----	-----	8
From other sources.....	663	26	140	42
Total volumes bought.....	3050	176	346	224
By exchange.....	147	41	9	-----
By binding pamphlets.....	1114	149	84	37
By binding serials.....	960	50	85	92
Given.....	2793	96	266	117
Total volumes not bought.....	5014	336	444	246
Total volumes added.....	8064	512	790	470
Pamphlets bought.....	50	-----	-----	14
Pamphlets given.....	11934	625	325	449
Pamphlets by exchange.....		-----	-----	-----
Total pamphlets added.....	11984	625	325	463
Total additions.....	20048	1137	1115	933
Total volumes in library.....		190938	191728	192198
B Bindery				
No. of vols. bound.....	2550	260	235	220
Value of new binding.....	\$2586 45	\$234 75	\$249 90	\$207 75
Value of other work.....	975 71	48 73	50 55	74 69
Total value.....	\$3562 16	\$283 48	\$300 45	\$282 44
C Cards added to catalogue				
Author.....	17219	657	1270	694
Title.....	6111	119	216	147
Subject.....	13052	570	1024	710
Total.....	36382	1346	2510	1551

D BOOKS, SERIALS, SUBJECT CARDS

This table does not include duplicates (estimated at 160,000)

Total on shelf list	Volumes					Serials		Subject		
	ADDED					Cost for 1896	Cost. for 1896	Total	1892	1893
	1892	1893	1894	1895	1896					
17373	663	620	567	654	528	\$262 00	\$455 12	4972	401	679
1853	55	92	154	70	62	50 91	28 92	1037	110	132
12639	466	259	1130	326	711	225 91	53 36	3647	402	240
28175	3337	3243	3641	3734	2926	4735 94	1055 20	12442	4042	2435
2640	65	175	167	86	99	46 40	22 16	1200	116	97
10585	498	621	753	392	529	478 09	268 25	8193	1059	895
18179	535	2648	891	614	1614	2607 66	616 42	6861	509	1090
2684	146	256	215	266	178	456 64	62 85	1844	174	191
12075	387	617	1398	458	431	185 60	10 93	10572	410	433
35892	1090	1514	1723	1003	986	1652 33	183 95	31605	4504	2148
142095					8064	\$10701 48	\$2737 16	82373		
134031				7603		8953 14	2213 20	69321		
126428			10639			10011 90	2167 67	53603		
115789		10045				11318 17	1997 00	39264		8340
105744	7242					9273 27	1801 48	30924	11737	

STATISTICS, 1 OCT. 1894-30 SEPT. 1895

1895								
Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
305	376	459	152	212	66	66	105	39
.....	1	15	35	17	1	.....	.....	.....
99	27	31	55	65	110	25	27	16
404	404	505	242	294	177	91	132	55
4	.....	.....	49	13	20	3	.....	8
47	85	109	121	109	230	28	55	60
49	94	63	102	114	67	72	113	59
189	185	652	236	300	524	127	42	59
289	364	824	508	538	841	230	210	186
693	768	1329	750	830	1018	321	342	241
21	.....	.....	2	12	1	.....	.....	.....
416	563	1796	644	2608	3403	398	486	281
.....
437	563	1796	646	2620	3404	338	486	281
1130	1331	3125	1396	3450	4422	659	828	522
192891	193659	194988	195738	196568	197586	197907	198249	198490
241	166	254	263	219	248	243	.....	201
\$225 20	\$211 90	\$287 65	\$262 60	\$209 90	\$247 95	\$241 30	.....	\$207 55
83 06	56 25	77 09	85 22	108 80	126 33	122 80	.....	142 19
\$308 26	\$268 15	\$364 74	\$347 82	\$318 70	\$374 28	\$364 10	.....	\$349 74
1751	2086	2128	2000	2885	1490	1419	661	78
867	983	947	804	1041	566	316	92	13
1557	1690	1651	1412	2145	875	702	653	63
4175	4759	4726	4216	6171	2931	2437	1406	154

AND DUPLICATES ADDED; BY CLASS

boxed and still inaccessible in the attic for lack of shelving.

cards			Duplicates								Total on shelves 1 Oct. '96
ADDED			Class	ADDED							
1894	1895	1896		1892	1893	1894	1895	1896	1896		
									Bound	Un-bound	
1110	1292	596	0	156	241	366	346	925	122	803	3749
266	194	113	100	11	67	42	71	90	7	83	337
1039	557	606	200	327	107	150	179	552	86	466	2238
970	1261	995	300	1309	1613	888	1900	6304	335	5969	16323
192	133	192	400	7	6	21	47	30	6	24	159
2595	2004	658	500	110	345	175	275	584	134	450	2937
2744	933	1085	600	381	1604	704	844	2427	365	2062	9446
290	357	524	700	12	18	32	62	161	22	139	364
1952	1469	5245	800	6	21	26	39	81	67	14	241
3181	7518	3039	900	215	213	131	241	300	148	152	2278
		13052	Year 1896					11454	1292	10162	38072
	15718		1895				4004				36618
14329			1894			2535					22614
			1893		4235						20079
			1892	2534							15844

E BOOKS, SERIALS AND SUBJECT CARDS IN EACH OF THE 100 SUBJECT DIVISIONS

This table shows additions made to books and catalogue in each subject and will serve for comparison from year to year.

Subject number	Divisions of classification	Volumes			Serials	Subject cards	
		Total	Added	Cost	Cost	Total	Added
	o General works						
010	Bibliography	3133	147	\$144 76	\$72 18	3456	424
020	Lib. economy	529	63	8 95	22 23	690	108
030	Cyclopedias	789	12	18 63		45	7
040	Collections	8				2	
050	Periodicals	8019	183	43 52	232 73	4051	12
060	Societies	1173	27	1 88	1 88	57	4
070	Newspapers	810	87		106 10	77	14
080	Polygraphy	2842	1	38		23	6
090	Book rarities	70	8	48 88		217	21
	o Total	17373	528	\$262 00	\$435 12	4972	596
100	Philosophy	160	4		\$12 90	39	
110	Metaphysics	36	2	\$1 10		23	3
120	Spec. met. topics	44	1	68		23	3
130	Mind and body	479	21	23 85	13 22	252	32
140	Systems	8				10	1
150	Psychology	178	13	13 15		151	20
160	Logic	39	1	90		17	2
170	Ethics	638	16	9 44	1 80	442	42
180	Ancient philosophy	72	1			30	4
190	Modern "	199	3	1 79		50	6
	100 Total	1853	62	\$50 91	\$28 92	1037	113
200	Religion	3047	101	\$42 88	\$41 85	387	42
210	Natural theology	277	10	12 04		100	9
220	Bible	1177	132	40 96	4 50	360	113
230	Doctrinal	915	68	9 15		315	65
240	Devotional	1230	77	11 18		711	45
250	Parochial	1077	30	2 23		233	46
260	Institutions	1583	110	12 76		360	78
270	Religious hist.	728	29	21 67		291	37
280	Churches	2264	126	41 58	7 01	652	131
290	Non-Christian	341	28	31 46		238	39
	200 Total	12639	711	\$225 96	\$53 36	3647	605
300	Sociology	800	40	\$33 25	\$37 75	390	57
310	Statistics	944	45	6 29	4 82	478	22
320	Political science	4291	451	162 88	127 45	1547	110
330	" economy	3621	256	71 10	113 37	2489	212
340	Law	8886	1427	4263 77	677 22	983	59
350	Administration	2133	229	56 13	29 96	1282	100
360	Associations	1760	100	13 45	6 30	1263	85
370	Education	4190	284	43 91	36 99	2546	233
380	Commerce	1063	76	51 57	9 50	817	37
390	Customs, etc.	487	18	33 59	11 94	645	80
	300 Total	28175	2926	\$4735 94	\$1055 20	12442	995

**E BOOKS, SERIALS AND SUBJECT CARDS IN EACH OF THE 100
SUBJECT DIVISIONS (continued)**

Subject number	Divisions of classification	Volumes			Serials	Subject cards	
		Total	Added	Cost	Cost	Total	Added
400	Philology.....	164	4	\$ 90	\$10 75	47	5
410	Comparative.....	87	4	5 67		59	7
420	English.....	946	34	9 53	1 00	424	83
430	German.....	216	12	9 00		118	21
440	French.....	244	17	8 70		113	18
450	Italian.....	27	2			16	4
460	Spanish.....	35	1			16	2
470	Latin.....	241	9			102	9
480	Greek.....	142	5	2 00	4 16	56	9
490	Minor languages.....	538	11	10 60	6 25	249	34
	400 Total.....	2640	99	\$45 40	\$22 16	1200	192
500	Natural science.....	3282	85	\$6 00	\$42 93	615	48
510	Mathematics.....	532	30	5 36	4 50	533	27
520	Astronomy.....	979	20	3 75	6 48	1104	40
530	Physics.....	417	30	23 10		547	63
540	Chemistry.....	563	97	150 95	8 60	440	41
550	Geology.....	1685	92	21 04	29 20	1501	173
560	Paleontology.....	292	10		5 88	400	32
570	Biology.....	532	27	41 15	31 35	535	33
580	Botany.....	713	36	63 04	14 30	707	73
590	Zoology.....	1590	102	163 70	125 01	1811	128
	500 Total.....	10585	529	\$478 09	\$268 25	8193	658
600	Useful arts.....	5672	82	\$ 2 25	\$10 13	196	25
610	Medicine.....	6856	1116	2124 77	558 64	4806	746
620	Engineering.....	1815	145	402 30	24 60	559	106
630	Agriculture.....	2402	202	7 20	9 25	531	67
640	Domestic economy.....	157	4			162	21
650	Communication.....	699	36	39 54	4 00	294	55
660	Chemical technology.....	271	12	50	4 80	133	18
670	Manufacturers.....	177	10	7 10	5 00	71	23
680	Mechanical trades.....	40	2	15 50		36	9
690	Building.....	90	5	8 50		73	15
	600 Total.....	18179	1614	\$2607 66	\$616 42	6861	1085
700	Fine arts.....	433	32	\$58 15	\$16 00	263	119
710	Landscape gardening.....	173	9	7 65		193	91
720	Architecture.....	518	56	249 83	27 25	368	127
730	Sculpture.....	244	3	9 58		156	53
740	Drawing.....	166	11	28 37	3 60	116	25
750	Painting.....	158	8	47 27		95	17
760	Engraving.....	64	3	7 34		84	20
770	Photography.....	61	3			35	5
780	Music.....	540	22	14 90	6 30	314	23
790	Amusements.....	327	31	33 55	9 70	220	44
	700 Total.....	2684	178	\$456 64	\$62 85	1844	524

**E BOOKS, SERIALS AND SUBJECT CARDS IN EACH OF THE 100
SUBJECT DIVISIONS (concluded)**

Subject number	Divisions of classification	Volumes			Serials	Subject cards	
		Total	Added	Cost	Cost	Total	Added
800	Literature	401	32	\$11 67		374	154
810	American	3298	90	18 38	\$1 80	3758	1631
820	English	4385	176	66 88	9 13	3865	2118
830	German	636	26	14 41		555	227
840	French	1266	43	42 81		790	436
850	Italian	308	4	2 08		145	93
860	Spanish	105	3	1 70		90	49
870	Latin	765	17	7 31		565	380
880	Greek	675	33	12 47		279	144
890	Minor languages	236	7	7 89		151	13
	800 Total	12075	431	\$185 60	\$10 93	10572	5245
900	History	1104	14	\$17 38	\$17 22	388	32
910	Geography	10404	186	271 60	51 44	8714	738
920	Biography	10661	410	715 55	79 80	13310	1402
930	Ancient history	525	13	17 05		380	33
940	Modern { Europe	4929	93	170 46	12 10	3120	348
950	{ Asia	258	7	10 33	5 00	206	13
960	{ Africa	56	2	4 95		66	6
970	{ No. America	7723	255	437 32	18 39	5153	450
980	{ So. America	180	1			209	6
990	{ Oceanica	52	5	7 69		59	11
	900 Total	35,892	986	\$1652 33	\$183 95	31605	3039

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Appendix 2

State Library Bulletin

LEGISLATION No. 7

December 1896

LEGISLATION BY STATES IN 1896

Seventh Annual Comparative Summary and Index

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PREFACE

As fast as proofs or advance copies of the session laws of each state can be secured, the separate laws are indexed on cards by the legislative sub-librarian, E. Dana Durand, Ph. D., and classified by subject. This is necessary to enable the state library to answer promptly frequent inquiries as to legislation in other states.

This index is printed at the end of the year in order that legislators, state officers and others may know at a glance what laws have been passed by states on any subject, without going to the library to consult the manuscript index. In most cases the laws are briefly summarized as well as cited, so that frequently consultation of the laws themselves is unnecessary. The aim is to give as far as possible a concise comparative view of current state legislation on all subjects except those of purely local interest. Such a summary is of course impracticable with general laws having many regulations or minor amendments. This annual bulletin should contribute materially to advancing standards of legislation and promoting uniformity, as it enables legislators with a minimum of labor to utilize the experience of other states which have recently been working on similar problems.

The references in the present bulletin cover 14 states. They include all the legislative sessions held in 1896 except those of Georgia and Vermont, held in the last quarter; together with the Georgia session held in the last quarter of 1895.

An unusually large number of important constitutional amendments were voted upon by the people in 1896, and information as to their adoption or rejection has been obtained from the secretaries of state. The amendments are placed in the summary under their proper subject-heads, but on page 408 a separate table, arranged by states and referring to the marginal numbers, is added.

Explanations

These must be carefully read to understand the bulletin.

The bulletin consists of two parts: summary and index.

The summary is classified under the general heads shown in the table of contents on the cover and in greater detail on page 317. More comprehensive laws are regularly put first under the headings, and in ascertaining what legislation has been passed concerning subordinate matters under the general subject, it is necessary to refer also to the more inclusive entries. Cross references must also be observed.

The index is an alphabetic list of all the specific topics contained in the summary, and refers to each entry by its marginal number. It is necessarily very condensed.

New legislation only is included; and when this is in the form of amendments, only those clauses which add to, or materially change old enactments are cited. In case some part of the former law, still retained, is necessary for clearness, it is printed in ordinary type and new matter in *italics*.

Citations, as a rule, are made by state, number of chapter, and date of approval. In Ohio and Rhode Island, where the governor's approval is not necessary, the date of final passage by the legislature is given. In the case of bills which are passed over the

governor's veto or become laws without his signature by expiration of time, the date of such passage or expiration is given. The laws of Ohio and Georgia are without chapter numbers, and references are to page numbers.

Any inquiries or correspondence pertaining to comparative legislation will be promptly answered if addressed Legislative sub-librarian, State library, Albany, N. Y.

MELVIL DEWEY

Director

LEGISLATIVE SESSIONS INCLUDED IN THIS BULLETIN

The sessions are biennial and the dates 1896 unless otherwise indicated.

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Georgia (<i>annual</i>)	23 O - 11 D '95	New York (<i>annual</i>)	2 Ja - 30 Ap
Iowa	13 Ja - 11 Ap	Ohio	6 Ja - 27 Ap
Kentucky	6 Ja - 17 Mr	Rhode Island (<i>annual</i>)	21 Ja - 15 My
Louisiana	11 My - 9 Jl		26 My - 28 My
Maryland	1 Ja - 30 Mr	South Carolina (<i>annual</i>)	14 Ja - 7 Mr
Massachusetts (<i>annual</i>)	1 Ja - 10 Je	Utah	7 Ja - 5 Ap
Mississippi	7 Ja - 24 Mr	Virginia	4 D '95 - 5 Mr
New Jersey (<i>annual</i>)	14 Ja - 26 Mr		

ABBREVIATIONS

Months

Ja	January	Ap	April	Jl	July	O	October
F	February	My	May	Ag	August	N	November
Mr	March	Je	June	S	September	D	December

States

Ga.	Georgia	Mass.	Massachusetts	O.	Ohio
Ia.	Iowa	Miss.	Mississippi	R. I.	Rhode Island
Ky.	Kentucky	N. J.	New Jersey	S. C.	South Carolina
La.	Louisiana	N. Y.	New York	Va.	Virginia
Md.	Maryland				

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State Library Bulletin

Legislation no. 7 December 1896

LEGISLATION BY STATES IN 1896

Seventh Annual Comparative Summary and Index

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(See also Crimes and punishments, 819; Religious corporations, 818)

Family

(See also Bastardy, 57; Family property, 498, 566; Guardians, 593; Orphans, 1191)

- 1 **Marriage.** General law of domestic relations. N. Y. 272, 17 Ap
- 2 Man may marry aunt of former wife. Va. 14, 17 D '95; 169, 28 Ja
- 3 Confirming rights of heritage of polygamous children.
Utah 41, 9 Mr
- 4 Legitimatizing polygamous children. Utah 82, 3 Ap
- 5 When woman lives out of state, marriage license to be issued by
clerk of county where marriage solemnized. Va. 77, 17 Ja
- 6 Increasing penalty for performing ceremony unlawfully. Person
solemnizing must be able to read and write English. Jewish
rabbi. Mass. 306, 22 Ap
- 7 **Divorce.** Absolute divorce may be granted *three* [formerly 5] years
after limited divorce for desertion. Va. 76, 17 Ja
- 8 Judgment may not be by default. Ga. p. 44, 16 D '95
- 9 **Support of family.** Abandonment or failure to support wife or
minor children a misdemeanor. Md. 73, 23 Mr
- 10 Court may allow deserted or neglected wife alimony. Provision for
children. Procedure. Utah 83, 3 Mr
- 11 When parents live apart or divorced, each has equal rights, and
court may order concerning support and custody as best for child.
N. J. 116, 26 Mr

Amusements

(See also Licenses, 432 Police, 979)

- 12 **Gambling.** Increasing penalty for engaging in or permitting.
Miss. 105, 21 F
- 13 **Playing dice for money prohibited.** La. 22, 2 JI
- 14 **Horse racing.** Amendments. Agricultural societies, when subject to law. Examination of racing associations. Certain acts not to be considered betting.
N. Y. 380, 23 Ap
- 15 **Unlawful from December to March.** Va. 781, 4 Mr
- 16 **Prohibiting pool selling on contests outside state.** Va. 539, 20 F
- 17 **Prohibiting pool selling in any way or place.** Va. 545, 29 F
- 18 **Prize fighting.** Increasing penalty to one to five years imprisonment. Extended to fight between man and animal. Va. 529, 28 F
- 19 **Penalties for engaging, acting as second, etc., aiding or betting on contest.** Ky. 5, 14 Mr
- 20 **Abetting, offering purse, etc., a misdemeanor.** S. C. 106, 11 F
- 21 **Sparring exhibitions, where admission fee is charged or contestants receive pay, prohibited.** Exception for athletic associations.
N. Y. 301, 17 Ap
Mass. 422, 21 My
- 22 **Shows. Theaters.** Penalty for immoral shows. Use of phonographs, etc.
Mass. 339, 28 Ap
- 23 **Reducing license for circuses and shows to \$100 [formerly \$200] a day, and broadening definition.** S. C. 92, 9 Mr
- 24 **Wearing hats obstructing view prohibited in theaters, etc.**
O. p. 122, 6 Ap
La. 62, 8 Je
- 25 **Bathing grounds.** Assignment of lands under water to hotels, etc. for.
Va. 235, 5 F

Intoxicating liquors. Narcotics

(See also Election places, 211; Adulteration of liquor, 1387)

- 26 **Prohibition.** Proposed repeal of prohibiting article in constitution.
S. D. 38, '95
Adopted by people, 1896. See footnote c, p. 408.
- 27 **Constitutional amendment providing for prohibition submitted to next legislature. Not adopted by legislature of 1896.**
Ia. 6, 24 Ap '94
- 28 **State dispensary system.** Revising law. Reorganizing state and county boards of control. Analysis of liquors. Prosecutions; etc.
S. C. 61, 6 Mr; 62, 9 Mr
- 29 **Local option.** Townships required to vote on question at next election, and on petition of 10 per cent of voters thereafter.
N. Y. 112, 23 Mr

- 30 **Liquor licenses.** General law, establishing state commissioner and increasing rates. Part of revenue goes to state. Hotels, druggists, etc. Penalties. Intoxication. N. Y. 112, 23 Mr
- 31 Readjusting classes and rates. No distinction between retail and bar-room license. Va. 699, 4 Mr
- 32 Towns and cities may license and regulate sale of domestic wines not to be drunk on premises. Peddling of one's own product. Ga. p. 91, 16 D '95
- 33 Rate \$350 [formerly \$250]. Distribution of funds. O. p. 34, 20 F
- 34 License commissioners of cities may appeal to court from their removal by mayor. Mass. 396, 13 My
- 35 Surety companies may sign bonds of more than one licensee. Mass. 169, 18 Mr
- 36 In townships where there is no municipality one half liquor taxes to go to roads. Ia. 25, 10 Ap
- 37 **Regulations and restrictions.** License for sale within one mile of camp meeting grounds prohibited. N. J. 26, 9 Mr
- 38 Liquor not to be sold within one and one half miles of soldiers' home. O. p. 369, 27 Ap
- 39 Sale of ale and beer at soldiers' home permitted. Use of proceeds for library, etc. N. Y. 900, 26 My
- 40 County jails outside village limits excepted from prohibition of sale within half mile of public institutions. N. Y. 445, 9 My
- 41 Prohibiting sale on holidays by holders of licenses for selling liquor to be drunk off premises. Mass. 308, 22 Ap
- 42 Prohibiting sale *under any circumstances* to minors or students [formerly, without consent, etc.]. Increased penalty. Va. 263, 5 F
- 43 Executors and administrators may sell wines made by deceased for six months without license. Miss. 100, 18 Mr
- 44 Certain exceptions in favor of native wine, beer and cider repealed. O. p. 55, 5 Mr
- 45 City councils may pass ordinances for prosecution of persons selling without license. La. 8, 26 Je
- 46 **Druggists.** Special duty of state board of pharmacy to investigate applications for license and violations of law. Penalties. Mass. 397, 15 My
- 47 Not to sell malt liquors. Ia. 60, 4 Ap
- 48 Wholesale druggists may sell alcohol to retail dealers without license. Miss. 71, 23 Mr
- 49 **Tobacco.** Increasing penalty for giving or selling to children under 16. O. p. 71, 7 Mr

- 50 Prohibiting manufacture or sale of cigarettes and cigarette paper. Ia. 96, 4 Ap
- 51 License of \$10 [formerly \$50] for sale of cigarettes. Md. 439, 4 Ap
- 52 Opium. Prohibiting opium dens. Ia. 95, 4 Ap
- 53 Opium and hasheesh joints declared public nuisances. Ia. 82, 17 Ap

Public order and decency

- 54 Cruelty to children. Torturing, cruel punishment, deprivation of food, etc.; penalty. Courts may remove children from custody of cruel, neglectful or immoral parents. Powers of societies. Va. 644, 8 Mr
- 55 Houses of ill-fame. Prohibiting employing or harboring child under 16. O. p. 398, 27 Ap
- 56 Prohibiting harboring of females under 18 or procuring such for prostitution. O. p. 207, 21 Ap
- 57 Bastardy. Support in case of, by towns. Procedure. N. Y. 225, 8 Ap
- 58 Sunday observance. Prohibiting hunting and fishing. S. C. 100, 2 Mr
- 59 Obscene literature. Increasing penalty. Applies to *written* matter. Ia. 69, 8 Ap
- 60 Concealed weapons. Increasing penalty for carrying to \$30 [formerly \$10]. Va. 745, 4 Mr
- 61 Reducing penalty for carrying, or for manufacturing certain weapons, to \$10 [formerly \$25]. Mass. 104, 11 Mr

Education

Public school organization

- 62 General school law. Utah 180, 5 Ap
S. C. 63, 9 Mr
- 63 New York city; general reorganization. Commissioners in place of trustees; inspectors; superintendent and assistants. N. Y. 387, 27 Ap
- 64 Proposing constitutional amendments relating to details as to public education. *Rejected by people*, 1896. La. 1895, '94

School districts

- 65 Amending procedure in altering or uniting. N. Y. 264, 15 Ap
- 66 Repealing certain provisions of act of 1894 as to property of abolished school districts. N. J. 49, 17 Mr

- 67 **Place of attendance.** Where one [? two] or more schools in same district, pupils to attend nearest school. Va. 318, 13 F
- 68 **Contracts for instruction** may be made with *any* city or village [formerly more than 6,000 population] or *union district*. Districts contracting with others for instruction may convey pupils free. N. Y. 264, 15 Ap
- 69 **Union free school districts.** Formation, organization, powers; act amended. N. Y. 264, 15 Ap

Officers

- 70 Not to be interested in contract for building or furnishing school-house. Va. 361, 5 Mr
- 71 **State board of education.** Established. Powers. Utah 130, 5 Ap
- 72 **Agents** shall not be interested in textbooks or supplies. Mass. 429, 25 My
- 73 **State superintendent.** Submitting constitutional amendment removing limit of salary at \$1,200. *Rejected*, 1896. Wis. 177, 11 Ap '95
- 74 Submitting constitutional amendment making state school commissioner elective instead of appointive by governor. *Adopted by people*, 1896.
- 75 **County board of education.** Established; powers. S. C. 63, 9 Mr
- 76 Amending as to appointment and terms of county board of school commissioners. Md. 341, 7 Ap
- 77 **Bills for services** to be approved by whom. Ga. p. 87, 16 D '95
- 78 **County superintendent.** To be elected and vacancies to be filled in same way as in case of other county officers. Miss. 108, 5 Mr
- 79 Submitting constitutional amendment separating office from that of probate judge. *Adopted by people*, 1896. Ida. p. 237, 9 Mr. '95
- 80 **Second examination** for position when no one passes first. Miss. 109, 18 Mr
- 81 **Township board.** To be elected from separate precincts, with one member at large. N. J. 150, 31 Mr
- 82 **Town districts** having from 800 to 1,500 children may increase trustees to *five* [formerly 3] on popular vote. N. J. 19, 5 Mr
- 83 **Certain towns** may vote to change number of school committee at other than annual meeting. Mass. 319, 27 Ap
- 84 **District board.** Fourth-class postmasters eligible as trustees. Va. 312, 13 F
- 85 **District** may extend term to *three* [formerly one] years, one trustee elected annually. R. I. 304, 31 Ja
- 86 **Term of school sub-directors** reduced to *one* [formerly 3] year. Ia. 40, 14 Ap

- 87 New bond or additional sureties may be required of treasurer by board of education. O. p. 210, 21 Ap

Buildings. Grounds

- 88 Towns (villages) may borrow \$50,000 for schoolhouses. N. J. 109, 26 Mr
- 89 Board of education in townships over 15,000, with consent of township committee, may issue bonds and construct. N.J. 33, 11 Mr
- 90 Appropriation of land authorized. Procedure. La. 96, 9 JI
- 91 U. S. flag. Must be displayed on schoolhouses. O. p. 86, 25 Mr

School finances (See also Public lands, 362)

- 92 State school funds. Regulating apportionment to counties and districts. N. J. 150, 31 Mr
- 93 Apportionment according to attendance of pupils five to 18 [formerly 21] and kindergarten children. N. Y. 264, 15 Ap
- 94 Submitting constitutional amendment that funds may be invested in bonds of local authorities in state. Limiting and regulating such investments. *Adopted by people*, 1896. Minn. 6, 11, Ap '95
- 95 Submitting constitutional amendment relative to investment. *Rejected by people*, 1896. Tex. p. 228, 27 Ap '95
- 96 Submitting constitutional amendment relative to investment. *Rejected by people*, 1896. Neb. 115, 29 Mr. '95
- 97 School tax. Counties to levy 3-mill tax. S. C. 63, 9 Mr
- 98 Certain delinquent taxes which become general state assets shall be turned over to county school funds when collected. S. C. 32, 9 Mr
- 99 Collection of school district taxes from canal and pipe line companies. N. Y. 575, 12 My
- 100 Increasing limit for second class cities. Ky. 17, 17 Mr

School debts (See also School buildings, 362)

- 101 Proposed constitutional amendment limiting school district debts to five per cent of assessed valuation. *Not voted on*. Ore. p. 611, 4 F '95
- 102 Accounting. Disposition of surplus school moneys at end of year in county or separate district treasury. Miss. 112, 19 Mr

Teachers

- 103 Employment. Pay. Pensions. Required age raised to 18. Contracts to be made for employment. N. Y. 264, 15 Ap
- 104 State to add two dollars a week to wages of teachers of special ability in small towns. Mass. 408, 16 My

- 105 Females to be paid same as males for same service. Utah 9, 11 F
- 106 Authorizing state organization of teachers for providing retirement fund out of contributions of members. Regulations.
N. J. 32, 11 Mr
- 107 Examinations and certificates. Establishing state system. Certificates acceptable in lieu of local examination. Miss. 106, 18 Ap
- 108 State (higher or professional) certificates. Requirements; effect of certificates, etc.
Utah 130, 5 Ap
Miss. 106, 18 Ap
- 109 County examiners may issue eight-year professional certificates. Qualifications. O. p. 121, 6 Ap
- 110 Act amended as to date and manner of conducting examinations. Questions. Ky. 18, 17 Mr
- 111 Teachers having taught five consecutive years under first grade license are exempt from further examination.
Miss. 107, 19 Mr
- 112 County school examiners' compensation. Advertising examinations. O. p. 215, 21 Ap
- 113 First class certificates valid *two* [formerly one] years.
Ia. 39, 10 Ap
- 114 Certificates issued to graduates of state normal school may be renewed every four years without examination. La. 91, 9 Jl
- 115 Requiring examination in elementary economics. Ia. 39, 10 Ap
- 116 Requiring examination in civil government. O. p. 36, 20 F
- 117 Normal schools. Changing system of scholarships in normal college. S. C. 64, 9 Mr
- 118 Local boards may accept gifts. N. Y. 165, 30 Mr
- 119 Teachers' institutes. Extending system. Must be held annually in parishes and teachers must attend. State board. La. 111, 9 Jl
- 120 Election and organization of executive committee of county institutes. O. p. 10, 6 F
- 121 May be formed for 25 [formerly 50] teachers *if in three contiguous towns*.
Mass. 183, 25 Mr
- 122 Summer institutes established; regulation; support.
N. Y. 156, 30 Mr

Instruction. Attendance. Discipline

- 123 Compulsory education. Children 7 to 14 must attend eight weeks yearly. Separate schools for white and colored. Ky. 36, 28 Mr
- 124 Miscellaneous minor amendments to law. N. Y. 606, 13 My

- 125 **Age.** (*See also* 93) Submitting constitutional amendment reducing minimum age of attendance to *five* [instead of 6]. *Rejected by people*, 1896. Mo. p. 288, '95
- 126 **Textbooks.** State school commissioner, governor and secretary of state to obtain terms from publishers, not over 75 per cent of regular wholesale price. Local boards may adopt only books so furnished and shall sell at not over 10 per cent advance to pupils. Books not to be changed within five years. O. p. 282, 22 Ap
- 127 County school commissioners to adopt, purchase and furnish free. Money therefor appropriated by state. Md. 185, 4 Ap
- 128 On popular vote any district may furnish free. Ia. 87, 7 Mr
- 129 Alcohol and narcotics. Act requiring instruction as to effects amended. N. Y. 901, 26 My
- 130 Graduation. Amending provisions for graduation of pupils and commencement exercises in district schools. O. p. 198, 18 Ap
- 131 Kindergartens. Independent school districts may establish free. Ia. 88, 13 Mr
- 132 Any *common* [formerly union] school district may establish free. N. Y. 264, 15 Ap

Higher. Professional. Technical

(*See also* Practice of medicine 1371; Dentistry 1377)

- 133 All higher educational institutions required to report annually to state superintendent of education. S. C. 63, 9 Mr
- 134 Submitting constitutional amendment regarding number, term and powers of board controlling state institutions. *Adopted by people*, 1896. *See footnote c*, p. 408. S. D. 36, '95
- 135 State superintendent of education *ex officio* trustee of state educational institutions. Miss. 115, 23 Mr
- 136 One tenth mill tax yearly higher, agricultural and technical education. O. p. 59, 9 Mr
- 137 State university. General law. Normal school. Utah 83, 2 Ap
- 138 Election of supervisors. La. 75, 9 J1
- 139 Number of trustees increased to 15 [formerly 9]. Classification of terms. Miss. 116, 16 Mr
- 140 Tax, annually at least .03 mill, for Ohio and Miami universities. (*Cf.* no. 136) O. p. 40, 26 F
- 141 One tenth mill tax for five years for erecting buildings. Ia. 114, 17 Mr
- Private educational institutions.** (*See also* Membership corporations, 313)
- 142 Petitions for acts of legislature to be advertised and presented before January 1, to secretary of board of education. Mass. 381, 9 My

- 143 County seminaries; property may be sold or transferred to common school districts. Ky. 14, 17 Mr
- 144 Agricultural and mechanical college. Establishing for negroes. S. C. 65, 3 Mr
- 145 Free tuition *five* [formerly 4] years. Students for admission to be selected by *lot* [formerly examination]. Miss. 113, 23 Mr
- 146 Name: agricultural and mechanical college *and polytechnic institute*. Va. 835, 5 Mr
- 147 Industrial education. Term of trustees of state industrial schools *four* [formerly 5] years. N. J. 48, 17 Mr
- 148 State scholarships in Worcester polytechnic institute. Mass. 407, 16 My
- 149 State scholarships in Massachusetts institute of technology; number increased and act amended. Mass. 310, 27 Ap
- 150 Girls' industrial institute and college; free tuition extended to *five* [formerly 4] years. Tuition in music. Miss. 114, 18 Mr

Libraries

- 151 State library. Three commissioners to be appointed in place of *ex officio* board. Powers. State librarian's duties. Distribution and exchange of public documents. O. p. 291, 22 Ap
- 152 Concurrence of governor and attorney-general for purchase of books. S. C. 67, 2 Mr
- 153 Cooperation of state. Local libraries may become associates of state library and may borrow books, receive advice, etc. Reports required. Traveling libraries established for loaning to clubs, schools, etc. Ia. 49, 8 Ap
- 154 Free public libraries. Cities and towns may establish on petition or popular vote. Tax limit. Government. Utah 54, 18 Mr
- 155 Authorizing taxes in cities for enlarging or changing building. N. J. 15, 5 Mr
- 156 Cities under special charter may use park land for site. Ia. 51, 14 Ap
- 157 Authorizing tax for sinking fund in cities over 15,000. Ia. 50, 19 Mr
- 158 Establishment must be under University law. N. Y. 576, 12 My

Scientific work. Art

(See also War relics and memorials, 1147)

- 159 Academy of sciences. Donating part of state exhibit at New Orleans and Chicago expositions. Md. 345, 4 Ap
- 160 State archives. Appropriation to state historical society for publishing. Md. 283, 2 Ap

- 161 **Geological and economic survey.** Established; regulation.
Md. 51, 19 Mr
- 162 **State geologist.** Made independent of University of the State of
New York. N. Y. 493, 11 My
- 163 **State museum.** Collection of Indian relics to be made.
N. Y. 586, 12 My
- 164 **Site and plans to be secured for historical and art museum.**
Ia. 115, 17 Ap
- 165 **Memorials. Monuments. Art.** Certain state relics turned over
to Confederate memorial society. Va. 803, 4 Mr
- 166 **Appropriation for silver service for battleship Iowa.** Ia. 118, 17 Ap
- 167 **State memorial to be placed in U. S. ship Massachusetts.**
Mass. Res. 84, 27 Ap
- 168 **Appropriation of land by historical societies for monuments.**
N. Y. 681, 15 My
- 169 **Towns may appropriate money for marking historic spots.**
Mass. 477, 4 Je
- 170 **Accepting gift of John Brown farm to state.** N. Y. 116, 25 Mr
- 171 **General Joseph Hooker; statue to be erected near state house.**
Mass. Res. 43, 28 Mr
- 172 **General H. W. Slocum; equestrian statue at Gettysburg.**
N. Y. 203, 4 Ap
- 173 **Samuel F. Smith; bust to be placed in state house.**
Mass. Res. 119, 9 Je
- 174 **Appropriation for purchase of portrait of Robert Toombs.**
Ga. p. 449, 16 D '95

Political regulations

(See also State and local government, etc.)

Citizenship. Civil rights

- 175 **Negroes.** Constitutional amendment allowing to reside in state
approved by second legislature. *Not voted on for lack of special
act for submission.* Ore. p. 613, 12 F '95
- 176 **Aliens.** No alien may hereafter acquire over 500 acres of land.
S. C. 91, 0 Mr
- 177 **Reducing restrictions on holding land.** Ia. 104, 14 Ap
- 178 **U. S. citizens preferred on state and local public works.**
Mass. 494, 5 Je

Elections

(See also, for term of office, vacancies, etc., State officers, 861; Local officers, 951, etc.)

- 179 **General laws.** Australian ballot adopted; alphabetic arrangement. Nominations, etc. La. 137, 9 Jl
Utah 69, 28 Mr
Utah 125, 5 Ap
- 180 **General revision and consolidation.** Md. 202, 2 Ap
N. Y. 909, 27 My
- 181 **Submitting constitutional amendment fixing date of general elections Tuesday after first Monday in November** [formerly October under amendment of 1890—previously November]. *Adopted (?) by people*, 1896. Fla. J. Res. 5, 29 My '95
- 182 **State ballot law commission.** *Ex officio* members dropped. Three members, *one at least from each of two leading parties* [formerly all from different parties]. Pay. Mass. 383, 9 My
- 183 **Suffrage. Qualifications.** Acts to carry into effect provisions of constitution of 1895 requiring ability to read and write, or assessment of \$300, and payment of poll tax. S. C. 21, 9 Mr; 22, 5 Mr
- 184 **Constitutional amendment requiring ability to read and speak English.** *Adopted by people*, 1896. Wash. 37, 8 Mr '95
- 185 **Restoration of convicts to citizenship, when.** Utah 2, 24 Ja
- 186 **Constitutional amendment allowing woman suffrage.** *Rejected by people*, 1896. Cal. J. Res. 27, 16 Mr '95
Adopted by people, 1896. Ida. p. 232, 21 Ja '95
- 187 **Constitutional amendment requiring registration, and ability to read constitution or ownership of property assessed at \$200.** *Rejected by people*, 1896. La. 200, '94
- 188 **Constitutional amendment requiring naturalization of aliens three months before election** [formerly voted on declaration of intention]. *Adopted by people*, 1896. Minn. 3, 2 Mr '95
- 189 **Constitutional amendment requiring naturalization three months before election.** *Rejected by people*, 1896. Mont. Pol. code, § 5200, 4 Mr '95
- 190 **Constitutional amendment requiring declaration of intention to become citizen six months before election.** *Adopted by people*, 1896. Tex. p. 227, '95
- 191 **Constitutional amendment requiring six** [formerly 4] **months residence in state, 30** [formerly 10] **days in election district.** *Adopted by people*, 1896. Minn. 3, 2 Mr '95
- 192 **Nominations. Primaries.** In cities over 40,000, candidate may appoint watcher at each primary polling place; registration certificate must be produced. S. C. 25, 9 Mr

- 193 Candidate or his agent may watch polls. Loitering, soliciting or showing ballot within 100 feet prohibited. O. p. 377, 27 Ap
- 194 Disabled voters may sign nomination papers by proxy. Names not to be added after papers certified. Notice of withdrawal of candidate must be filed. Caucuses, minor amendments. Mass. 469, 4 Je
- 195 Date of filing certificates of nominations to vacancies in special elections. Election officers. Ia. 68, 25
- 196 Candidates named by two or more parties must choose on which ticket to be placed in official ballot. O. p. 185, 17 Ap
- 197 Political parties. Choice of name for ballots not to conflict with other parties. Party committees to hold till successors are chosen. Committees where wards change. Mass. 469, 4 Je
- 198 Registration of voters. General law. Required biennially. La. 89, 9 J1
- 199 General law. Required of all voters. House to house canvass. Utah 128, 5 Ap
- 200 General amendments to conform to constitution of 1895. S. C. 22, 5 Mr
- 201 Required only in cities over 3,500 [formerly 2,500]. Ia. 62, 10 Ap
- 202 Fixing compensation of board of registry and election. N. J. 47, 17 Mr
- 203 When last registration day is holiday, registration to be on preceding day. Mass. 73, 12 F
- 204 Voting precincts. To contain not over 1,000 [formerly 800] voters in cities. Mass. 244, 7 Ap
- 205 Election officers. Amending law as to organization of county election supervisors and as to appointment and removal of judges, clerks, etc. O. p. 145, 10 Ap
- 206 Provisions in case of illness or disability of members of election board. Va. 700, 4 Mr
- 207 In absence of all managers of election voters present may elect new managers. S. C. 21, 9 Mr
- 208 County chosen freeholders to fix and pay compensation of district and county boards of registry and election. N. J. 147, 30 Mr
- 209 Election blanks to be furnished to notaries who are *ex officio* justices. Ga. p. 23, 4 D '95
- 210 Polling places. Township or municipal clerk to designate places of registry and election. May construct buildings in street. N. J. 149, 31 Mr
- 211 Elections not to be held where liquor is sold. N. J. 16, 5 Mr

- 212 Ballots. Voting.** Pastors; same restrictions as for original ballots. *Mass.* 469, 4 Je
- 213 Stamps with X and precinct number may be used in any town or city.** *Mass.* 518, 9 Je
- 214 Assistance to voters.** Only allowed in case of apparent physical disability. Oath of voter also required. *O. p.* 148, 10 Ap
- 215 To be by a judge of election designated by other judges** [formerly by special constable]. *Va.* 700, 4 Mr
- 216 Voting machines.** Davis automatic ballot machine; towns or cities may use for all elections. Regulations. *N. Y.* 339, 21 Ap
- 217 McTammany ballot machine may be used in all elections.** State to supply towns free; restricted to 50 machines for 1896. *Mass.* 498, 5 Je
- 218 Myers ballot machine; towns may adopt** [formerly on authority of county supervisors] for all elections. Preparation of machines. *N. Y.* 168, 30 Mr
- 219 Constitutional amendment allowing voting to be by other means than ballot, if secrecy be preserved.**
Adopted by people, 1896. *Cal. J. Res.* 8, 20 F '96
Rejected by people, 1896. *Neb.* 114, 29 Mr '95
- 220 Corrupt practices. Frauds. Definitions and penalties.** Candidates and committees to report expenses. *Utah* 56, 19 Mr
- 221 Limitation and reports of expenses of candidates for nomination or election.** Reports of political committees. *O. p.* 123, 8 Ap
- 222 Unlawful to solicit money from, or seek to sell tickets, etc., to candidates.** *N. J.* 173, 14 Ap
- 223 Electioneering and use of posters near polls; act amended.** *N. Y.* 549, 12 My
- 224 Penalties on election officers for violating law.** Issuance or acceptance of illegal registration certificate. *S. C.* 105, 9 Mr
- 225 Special classes of elections.** Presidential electors. Election; meetings and choice of candidates. *Utah* 57, 19 Mr
- 226 Manner of preparing official ballot for presidential electors.** *Va.* 700, 4 Mr
- 227 Canvass and certificate of election of U. S. representatives.** *Utah* 47, 13 Mr
- 228 In state or local elections on any question submitted, majority of those voting on question sufficient.** *N. J.* 80, 24 Mr
- 229 Official ballots not required in county or city elections where no party nominations are made.** *Va.* 700, 4 Mr

- 230 Constitutional amendment that parochial elections shall be on same day as general elections. *Rejected by people*, 1896. La. 192, '94
- 231 City elections in cities over 100,000 held in April. N. J. 114, 26 Mr
- 232 Registration of voters and canvass of votes in charter elections of cities over 40,000. N. J. 3, 19 F

Law-making. Legislature

(See also appendix on Constitutional amendments, p. 408; powers of legislature, 604-610; 642, 901 927)

- 233 Constitutional amendments. Proposed amendment allowing legislature to propose amendments to same article as often as once in *two* [formerly 4] years and as many as *three* [formerly 1] amendments at a session. *Rejected by people*, 1896. Ill. p. 331, '95
- 234 Legislature and officers. Submitting constitutional amendment requiring *biennial election* [now annual] of legislature. *Rejected by people*, 1896. Mass. Res. 71, 17 Ap
- 235 Submitting to next legislature amendment increasing membership of lower house to 115 [now 100] and changing provisions as to apportionment. Ia. J. Res. 9
- 236 Apportionment of members of state legislature. Ia. 125, 126, 2 My
- 237 Clerks and their assistants given same immunities as to arrest and civil suits as members. Va. 86, 18 Ja
- 238 Compensation of chaplains of legislature. Ia. 97, 24 Mr
- 239 Readings of bills. Submitting constitutional amendment that first reading must be by title only unless one third of members desire sections, but that last reading must be by sections [formerly all three by sections except by two-thirds vote]. *Adopted (?) by people*, 1896. Fla. J. Res. 2, 30 My '95
- 240 Submitting to people constitutional amendment allowing revisions of statutes to be read as legislature may prescribe. *Rejected*, 1896. La. 192, '94
- 241 Private bills. To be printed under supervision and on terms secured by superintendent of printing, but at expense of applicant. Va. 293, 12 F
- 242 Notice of introduction of bills regarding bridges over navigable waters to be published five days in newspapers. N. J. 55, 18 Mr
- 243 Lobbying. Counsel or agent must file written authority from principal. Mass. 342, 28 Ap
- 244 Uniform legislation. Commission established permanently to co-operate with other states. B. I. 352, 15 My
- 245 Appointment of commissioners. Md. 264, 2 Ap
Va. 744, 4 Mr

- 246 Consolidation and revision of laws.** Commission created.
Mass. Res. 87, 28 Ap
Utah 85, 3 Ap
- 247 Establishing permanent office of code commissioner.** Statutes to be revised in 1901 and every 10 years. **S. C.** 1, 7 F
- 248 Adoption of code and provision for publication.** **Ga.** p. 98, 6 D '95
- 249 Codes prepared by official revisers have also been published by North Dakota, New Jersey, Rhode Island and Washington.**
- 250 Publication of laws.** Use of "that" or other prefixes before sections forbidden. Chapters to have Arabic numerals.
N. J. 1, 4 F
- 251 Amending law as to distribution of slips of session laws to local officers.** **N. Y.** 259, 15 Ap
Legislative printing and documents (*See also* Supreme court reports, 616)
- 252 Changing maximum rates for printing.** **S. C.** 87, 9 Mr
- 253 Adjusting dates of state reports and printing to session of legislature beginning January.** **S. C.** 89, 9 Mr
- 254 Providing for reduction of length of reports and for printing as cheaply as possible.** **S. C.** 88, 9 Mr
- 255 Illustrations not to be used except by approval of secretary of the commonwealth.** **Mass.** 258, 11 Ap
- 256 Regulating distribution of documents by secretary of state.**
Utah 61, 23 Mr
- 257 Distribution and exchange of documents by state library.**
O. p. 291, 22 Ap

Labor

(*See also* Exemptions, 505; Mechanics' liens, 520; Actions for debt, 774; Convict labor, 1204; Railways, 1301; Mines, 1437)

- 258 Bureau of labor statistics.** Deputy to be appointed. Summoning of witnesses. Entering factories on complaint or to obtain information. Annual report required of factories. **Ia.** 86, 14 Ap

Employment. Wages. Relations to capital

- 259 Free employment bureaus.** Commissioner of labor statistics to establish in New York city. **N. Y.** 982, 23 My
- 260 Employers' liability.** General provisions as to liability for personal injury due to negligence extended to employers. Who may bring suit. **Miss.** 86, 23 Mr
- 261 Liability for injuries through fellow-servants extended to all corporations [formerly only railroads].** Distribution of damages to relatives. **Miss.** 87, 11 Mr

- 262 Definition of fellow-servants. Any person having superintendence or authority to direct is vice-principal. Person engaged in another department not a fellow-servant. Utah 24, 21 F
- 263 Contracts exempting master from liability to servant for negligence of master or other servant, are void. Ga. p. 97, 16 D '95
- 264 Blacklisting. Defining and prohibiting. Utah 6, 3 F
- 265 Alien labor. U. S. citizens to be preferred on state and local public works. Mass. 494, 5 Je
- 266 Board of arbitration. Established. Investigation of strikes, etc., and public report, on application of one party or on initiative of board. When decision binding; appeals. Utah 62, 24 Mr
- 267 Extending powers. To investigate on petition of one party or on its own initiative, and publish report as to responsibility. O. p. 324, 27 Ap
- 268 Wages. Bi-weekly payment required of all manufacturing establishments. No contract to avoid. N. J. 179, 16 Ap
- 269 Weekly payment required of all contractors. Mass. 334, 28 Ap
- 270 Prohibiting contracts exempting from weekly payment. Mass. 241, 6 Ap
- 271 Special rights of wages. Preferred claim in case of insolvency of person, firm or corporation. Utah 49, 13 Mr
- 272 Personal property of employer not to be taken on execution till wages due employees, not exceeding two [formerly one] months wages, are paid. N. J. 27, 9 Mr
- 273 Special rights in insolvency of employer extended to salesmen. Md. 184, 2 Ap
- 274 In suits for wages plaintiff to be allowed attorney's fee of not less than \$5 nor more than \$10. Utah 40, 7 Mr

Protection. Health and safety

- 275 Factory inspection. 29 [formerly 24] deputy inspectors. Increased penalties for violation of law. N. Y. 991, 29 My
- 276 Children and women. Employment in mercantile establishments. Not over 10 hours a day for minors. No children under 14, except in school vacations. Toilet-rooms. Seats for women. Employment in basements. Penalties. N. Y. 384, 23 Ap
- 277 Children in manufacturing establishments. Certificate from board of health necessary when child under 14. School attendance. Work during vacations, and other regulations. N. Y. 991, 29 My
- 278 Seats for female employees required in mercantile establishments. Md. 147, 2 Ap

- 279 Factories.** Water-closets must secure absolute privacy.
N. J. 172, 14 Ap
- 280 Blowers required on dust-creating machinery** — emery wheels, etc.
O. p. 186, 17 Ap
- 281 No traversing carriage shall pass within a foot of a pillar or fixed structure in cotton factory.**
Mass. 343, 28 Ap
- 282 Brickyards.** Overwork or work before 7 a. m. allowed by contract and for pay.
N. Y. 789, 20 My
- 283 Factories and sweat-shops.** In Baltimore not to use oil or gasoline for light or heat; to have fire-escapes.
Md. 364, 4 Ap
- 284 Bakeries and confectioneries.** Hours of labor — not over 60 per week. Regulating sanitation. Health of employees.
O. p. 393, 27 Ap
N. J. 181, 16 Ap
Mass. 418, 19 My
- 285 Act for regulation and inspection (1895) amended.**
N. Y. 672, 14 My
- 286 City council of Baltimore may regulate and inspect.** Md. 273, 2 Ap
- 287 Sweat-shops. Tenement-house labor.** Prohibiting manufacture of clothing, tobacco, etc., in rooms used for family purposes. Requirements as to air-space, water-closets, etc., for shops where such goods are made.
O. p. 317, 27 Ap
- 288 Factory inspectors to report contagious diseases or unwholesome goods to boards of health.**
N. Y. 991, 29 My
- 289 Penalty for allowing goods to be made up in sweat-shops, with reasonable means of knowledge [formerly knowingly].**
Md. 467, 4 Ap

Corporations

(See also Taxation corporations, 413; Insurance, 1242; Transportation, 1288; Light and water 933; etc.)

General

- 290 General laws.** General revision and amendment. Utah 87, 4 Ap
N. J. 185, 21 Ap
- 291 General incorporation law.** Fees. S. C. 45, 9 Mr
- 292 Fees of secretary of state for filing papers.** Mass. 523, 9 Je
- 293 Name and office.** Banking, insurance or transportation corporations may change. Procedure; fee. Ga. p. 52, 13 D '95
- 294 Name not to be so similar to existing corporation as to mislead.**
O. p. 320, 27 Ap
- 295 Change of place authorized.** Procedure. N. Y. 929, 27 My

- 296 **Officers.** Officers and directors need not live in particular county.
N. J. 64, 19 Mr
- 297 **Court may fix number of directors at three if capital not over \$10,000.**
Va. 4, 14 D '95
- 298 **Treasurers' bonds may be executed by surety companies.**
Mass. 346, 28 Ap
- 299 **Capital stock.** Amendment to constitution to limit to face value of stock. *Rejected by people, 1896.* Cal. Res. 18, 9 Mr '95
- 300 **Procedure to compel payment of unpaid stock subscriptions.**
Va. 22, 19 D '95
- 301 **Procedure to secure new certificate when certificate has been lost seven years or more.**
Va. 34, 9 Ja
- 302 **Notice of use as collateral; to be considered in law as transferred on books. Not subject to assessment by corporation when so used.**
Ia. 81, 14 Ap
- 303 **Consolidation.** Merging when one corporation owns all stock of another.
N. Y. 932, 27 My
- 304 **Reports.** Expense of investigation on failure to report to be borne by corporation.
N. J. 188, 21 Ap
- 305 **Foreign corporations.** (*See also* 252) Stockholders of corporations hereafter admitted, liable as those of domestic corporations. Improper payment of capital.
Mass. 391, 12 My
- 306 **Dissolution.** Authorizing voluntary dissolution except of banks, insurance or railway companies. Procedure. N. Y. 932, 27 My
- 307 **In case of equal division of trustees of stockholders for and against a course of action.**
N. Y. 569, 12 My
- 308 **Insolvent corporations.** Same provisions as to fraudulent conveyances and preferences as for natural persons. Md. 349, 4 Ap
- 309 **Receivers.** Place of application for appointment. Applications by attorney-general. N. Y. 282, 17 Ap
- 310 **Surety companies may sign bonds. Sureties shall be notified of accounting of receiver.**
N. Y. 94, 11 Mr
- 311 **Appeals from orders allowing payment of counsel and attorney fees to receivers of certain corporations.**
N. Y. 139, 27 Mr
- 312 **Manufacturing corporations.** Dissolution on petition of one fifth of stockholders in certain cases. O. p. 138, 10 Ap

Corporations not for profit

(*See also* Private educational institutions, 142; Fraternal societies, 1257; Charities, 1157, 1189; Agricultural societies, 1443)

- 313 **Membership corporations generally.** Authorizing and regulating consolidation of educational, charitable and other non-stock corporations.
Md. 410, 4 Ap

- 314 Limit of property of corporation under special charter same as if under general law, \$500,000. **Mass.** 96, 15 F
- 315 Procedure for sale of real estate of charitable and religious societies. **O. p.** 397, 27 Ap
- 316 Misdemeanor to wear G. A. R. or secret society badges unauthorized. **Ky.** 10, 17 Mr
- 317 Political clubs. Directors exempt from certain requirements of corporations. **N. Y.** 542, 11 My
- 318 Religious corporations. Amending law in relation to consolidation of churches. **N. Y.** 56, 29 F
- 319 Special police for religious meetings must be appointed on application of conductor. **Va.** 523, 28 F
- 320 Presbyterian; amending law as to incorporation. **N. Y.** 190, 1 Ap
- 321 Baptist; general provisions for incorporation. **N. Y.** 336, 21 Ap
- 322 Methodist; incorporating the national general conference. **Md.** 192, 2 Ap
- 323 Camp-meetings; prohibiting carrying on business at or near. Special police may be appointed. **Va.** 466, 24 F

Banking and loan institutions

(See also Taxation, 420; Married women, 502)

- 324 State bank examiner. Office established. Duties. **S. C.** 48, 9 Mr
- Banks—general** (including banks of deposit and provisions applying both to them and following classes)
- 325 Deposit required of foreign banking and building-loan institutions. **N. Y.** 452, 9 My
- 326 Capital. Only \$15,000 [formerly \$25,000] must be paid in, and \$25,000 [formerly \$50,000] subscribed before doing business. **Ga. p.** 54, 14 D '95
- 327 Procedure to increase or decrease capital. **Ga. p.** 56, 16 D '95
- 328 Mode of making up impaired capital. **Ga. p.** 58, 16 D '95
- 329 Bank notes may be issued regardless of capital, on depositing double amount in U. S. or Georgia bonds. **Ga. p.** 59, 16 D '95
- 330 Loans; extending limit on collateral security. **N. Y.** 452, 9 My
- 331 Insolvent banks; attorney-general to apply for receiver; duties. **Ga. p.** 58, 16 D '95
- 332 Unclaimed funds paid to state by receiver to be held as special deposit, but income to be used by state. **B. I.** 399, 28 My

- 333 Savings banks. Number of trustees may be increased.
N. Y. 453, 9 My
- 334 Penalty for neglect to make or for false reports. Mass. 327, 27 Ap
- 335 Savings and cooperative banks; bonds of treasurers may be given by surety companies. Mass. 361, 2 My
- 336 Safe deposit, loan and trust companies. May not give security for deposits. Must set aside guaranty fund of 25 per cent of capital. Certain powers only after authority by savings bank commissioners. Mass. 423, 21 My
- 337 Trust and guaranty companies; additional deposit with state if doing guaranty business. Md. 160, 2 Ap
- 338 Required capital of trust companies reduced to \$25,000 [formerly \$50,000] in counties under 25,000 population. Ky. 31, 21 Mr
- 339 Trust companies; oath of office required of directors. Form.
N. Y. 452, 9 My
- 340 Mortgage, loan and investment companies. General incorporation law.
N. Y. 452, 9 My
- 341 Certain exceptions to restrictions as to land ownership in favor of loan companies not to apply to companies charging over 8 per cent interest.
Ga. p. 24, 13 D '95
- 342 Building-loan associations. General law regulating. Examination by state auditor annually. Report. Foreign associations.
Ia. 85, 7 Ap
- 343 Surplus funds invested as those of savings banks. N. Y. 452, 9 My
- 344 Minors may hold stock independently. Restrictions. La. 83, 9 Jl
- 345 Foreign associations to designate agent for service of process in each county where doing business. Miss. 57, 9 Mr
- 346 Cooperative banks. Investment of surplus funds.
Mass. 277, 13 Ap
- 347 Shares forfeited by default to be held for owner at value at time of forfeiture [formerly at time of first default]. Mass. 285, 14 Ap
- 348 Foreign; not hereafter to be admitted to state unless now established.
Mass. 286, 14 Ap

Trusts and combinations

(See also Insurance, 424; 1263)

- 349 Pools and trusts. Definitions and penalties. Contracts void. Corporations participating forfeit franchise. Liability to person injured.
Utah 89, 9 Mr
- 350 Act prohibiting made more stringent. Actions by attorney-general directed. Witnesses not excused from incriminating answers.
N. Y. 267, 15 Ap
N. Y. 933, 23 My

- 351 Person producing or owning commodity whose price is affected by combination may recover \$500 besides damages. *Miss.* 89, 11 Mr
- 352 Submitting constitutional amendment to prohibit trusts and combinations. *Adopted by people, 1896. See note c, p. 408.*
S. D. 37, '95

Finance

State finance

State taxes. For general provisions see Taxation. See also Education, 135, 140 ; Canals, 1351

- 353 State debt. Various bond issues authorized. *Utah* 77, 2 Ap
Mass. 466, 472, 481, 4 Je; 531, 535, 9 Je
- 354 Submitting constitutional amendment allowing loan of \$1,200,000 for outstanding floating debt. *Rejected by people, 1896.*
Col. 65, 8 Ap '95
- 355 No bond may be paid or funded more than 20 years after maturity.
S. C. 72, 25 F
- 356 Bonds already paid to be destroyed. *Miss.* 41, 10 Mr
- 357 Accounting. Deposit. Miscellaneous. Current state expenses may be met by selling "tax assignment" negotiable orders, making given amount of taxes due state from any city or town payable to bearer.
B. I. 303, 31 Ja
- 358 Debts due state preferred claims against estates of decedents.
Va. 252, 6 F
- 359 Jurisdiction of appeals from board of claims. *N. Y.* 451, 9 My
- 360 State depositories; governor may revoke designation on failure to contract to pay interest.
Ga. p. 22, 14 D '95
- 361 Gifts or devises may be accepted and managed according to prescribed conditions.
Ia. 66, 19 Mr
- 362 State lands. (*See also* Veterans, 1031) General law. State board created. Settlement and sale. Timber. Leases. Investment of funds.
Utah 80, 2 Ap
- 363 Letters patent to be recorded by secretary of state.
N. Y. 517, 11 My
- 364 State land-office; hours 9 to 4. Commissioner to take necessary oaths free of charge.
Miss. 50, 19 Mr
- 365 Escheated lands; secretary of state to have charge. Regulating sale.
S. C. 76, 9 Mr
- 366 Where title to land bought of state fails, purchaser may select equal amount of land elsewhere.
Miss. 46, 18 Mr

Taxation — general

(Chiefly relating to general property taxes. See also School taxes, 97; Local taxes, *a* 452; Road taxes, 1058, 1072; Fertilizers, 1460)

- 367 General laws. Consolidation of all laws. N. Y. 908, 27 Mr
- 368 Introducing listing system. Equalization. Mortgages, stocks and bonds taxed according to interest thereon. Corporation taxes additional. Md. 120, 27 Mr
- 369 General revenue act. Corporations how assessed. Utah 129, 5 Ap
- 370 Commission to report on improvements of system. Mass. Res. 111, 4 Je
- 371 Assessors and assessment. Pay of township board of commissioners when acting as assessors. S. C. 30, 9 Mr
- 372 Taxpayers' lists shall be kept secret. Md. 142, 30 Mr
- 373 Rejection of non-residents' taxes by state comptroller for imperfect description; act amended. N. Y. 951, 28 Mr
- 374 Cities over 100,000; on petition taxes, assessments or water rates on any property shall be apportioned among subdivisions of such property. N. J. 118, 28 Mr
- 375 Assessment — personal property. Assessment may be made any time after January 1, and shall be as of date of assessment. Utah 10, 12 F
- 376 Commissioner in chancery to be designated to ascertain personal property under fiduciaries and courts, when taxable, and report for assessment. Va. 705, 4 Mr
- 377 Government currency to be assessed. Ia. 31, 14 Ap
- 378 Bonds and stocks, if paying 6 per cent, to be assessed at 50 per cent of face value; if paying other rates, tax in exact proportion. Md. 120, 27 Mr
- 379 — Amended; shall be assessed at actual value; rate of local taxation shall be 30 cents on \$100. Md. 143, 30 Mr
- 380 Corporations may agree to pay taxes on bonds and mortgages issued or made by them. Md. 140, 30 Mr
- 381 Mortgages to pay 8 per cent on amount of interest. Covenants for payment by borrower void. Distribution of proceeds. Md. 120, 27 Mr
- 382 Bicycles assessed as vehicles. Ia. 30, 14 Ap
- 383 Collectors and collection. Amending law as to duty and liability of sheriff or tax collector for uncollected taxes or failure to pay over moneys. Ky. 15, 17 Mr

^a Under local taxes are placed only those laws which in the very strictest manner belong there, as limitations on rate, etc. Provisions for assessing and collecting general taxes in local bodies are placed in this division.

- 384** Amending procedure for recovery from delinquent county and city treasurers and their sureties. Va. 92, 21 Ja
- 385** Governor to suspend collectors from office when in default. La. 118, 9 J1
- 386** Statement of accounts of county and city treasurers to be prepared by state auditor and posted in respective counties. Va. 209, 30 Ja; 697, 3 Mr
- 387** Discretion given county treasurer as to places of attendance for collection. S. C. 81, 7 F
- 388** Taxes prior to any other lien or incumbrance. Va. 220, 1 F
- 389** Receivers and assignees shall pay unpaid personal taxes out of personalty before any other claim. N. J. 127, 26 Mr
- 390** Non-resident taxes; repealing provision allowing payment to county auditor. Miss. 48, 18 Mr
- 391** Delinquent taxes. Tax sales. Taxes unpaid 12 months become assets of state subject to collection by sinking fund commissioners. S. C. 120, 26 Mr
- 392** Treasurers to make list before *July 1* [formerly June 15]. Va. 129, 23 Ja
- 393** City clerk to record papers relating to sale of land for taxes, assessments, etc. Sale of lands bought in by city. Notice to next of kin of person entitled to redeem. N. J. 134, 30 Mr
- 394** Timber on land where tax is unpaid may be sold, or land may be rented for one year. Va. 181, 23 Ja
- 395** Penalty on tax collector for selling land after taxes paid. Miss. 47, 20 F
- 396** Amending as to sale of lands bought in by state. Va. 179, 29 Ja
- 397** Under certain circumstances property bid in by state may be sold for any sum equal to face value of taxes due. La. 126, 9 J1
- 398** Regulating sales for delinquent municipal taxes. La. 93, 9 J1
- 399** Where property belonging to municipal corporation but not used for public purposes is delinquent in taxes, only use and occupancy, not fee, to be sold. S. C. 34, 9 Mr
- 400** Moneys in excess of tax due, if unclaimed two years, go to general county fund. Miss. 44, 23 Mr
- 401** Redemption. May be within *four* [formerly two] years. Utah 18, 17 F
- 402** Submitting to people constitutional amendment as to payment of penalty and taxes on redemption. *Rejected*, 1896. La. 192, '94
- 403** Equalization of taxes. County supervisors may appoint three commissioners for. Powers and duties. N. Y. 820, 21 My

- 404 County boards of equalization not to be paid over five days a year except when real estate to be equalized, then 10 days. S. C. 29, 25 F
- 405 Before increasing assessment of personalty, equalization board must give notice to person. O. p. 218, 21 Ap
- 406 Exemptions from general property tax. Reserved burial grounds not over half acre. Va. 178, 28 Ja
- 407 Crematories. Ia. 29, 14 Ap
- 408 Soldiers' monuments, parks and memorials. Md. 300, 2 Ap

Special forms of taxation

- 409 Poll taxes. Lien upon real estate of person. Va. 380, 19 F
- 410 Collateral inheritance tax. Five per cent imposed. Collection. Va. 334, 14 F
- 411 Five per cent on all above \$1,000. Life and remainder estates. Ia. 28, 14 Ap
- 412 Distributive share under \$500 exempt. Mass. 108, 25 F

Corporations

- 413 Incorporation fees. \$25 plus \$1 per \$1,000 of stock over \$10,000, but fees not to exceed \$350. Ia. 98, 10 Ap
- 414 Amending as to collection, and increase of capital. Va. 661, 3 Mr
- 415 Corporation taxes. State taxes at various rates on gross earnings of all transportation, safe deposit, trust, guaranty, electric, gas and fertilizer companies. Railroad tax graduated. Md. 120, 27 Mr
- 416 State tax one half per cent on gross earnings of lighting, water, pipe-line, street railway and railway companies. O. p. 79, 19 Mr
- 417 Constitutional amendment allowing special modes of taxing sleeping-car, telegraph, express, insurance, mining, booming and ship-building companies. Tax may be progressive, etc. Adopted by people, 1896. Minn. 7, 26 Ap '95
- 418 Forfeiture of charter for non-payment. Actions to enforce payment. N. J. 187, 21 Ap
- 419 When property of corporation sold by legal process, any unpaid taxes shall first be paid. Md. 407, 4 Ap
- 420 Bank shares. Amending as to rate, manner of assessing and collecting tax. Va. 669, 3 Mr
- 421 Tax a lien on stock wherever found, prior to any assignment or other claim. Va. 642, 3 Mr
- 422 Building-loan associations. Certain exempt from taxes. Md. 140, 30 Mr

- 423 Insurance companies.** Tax one and one-half per cent on gross premiums, less any other taxes paid. **Utah 97, 5 Ap**
- 424 Companies making no additional charge because of "valued policy" law, and not connected with any combination to fix rates, pay two per cent tax on premiums in lieu of all other taxes, otherwise privilege tax of \$1,500.** **Miss. 56, 20 Mr**
- 425 Penalty for placing insurance on property in state through offices outside, for evasion of tax.** **Va. 224, 5 F**
- 426 Surety companies.** To pay two per cent on premiums received. **N. J. 219, 2 Je**
- 427 Railroads.** Assessment of rolling stock to be divided among counties according to miles of track. **Md. 140, 30 Mr**
- 428 Commissioner of railroads added to board for equalizing taxes.** **O. p. 72, 17 Mr**
- 429 Act providing for taxation of lands granted by state or U. S., and not used for railway purposes. Adopted by people on referendum, November 3, 1896.** **Minn. 168, 19 Mr '95**
- 430 Freight-line companies.** One per cent tax on capital of companies operating freight cars. **O. p. 89, 30 Mr**
- 431 Express companies.** Tax one per cent on gross receipts. **Ia. 32, 14 Ap**

Business and privilege taxes. Licenses (*See also* Liquor licenses, 29; various special licenses under subject, as Insurance agents, Medicine)

- 432 General schedule.** Collection. **Miss. 35, 14 Mr**
- 433 Person increasing business to pay added tax only on increase.** **Miss. 37, 14 Mr**
- 434 Council in cities over 100,000 may delegate power of granting licenses to a committee.** **N. J. 159, 9 Ap**
- 435 Fees for issuing three months' licenses, 50 cents.** **Va. 662, 3 Mr**
- 436 Commissioners of revenue to report licenses issued, on June 30 and December 31.** **Va. 688, 3 Mr**
- 437 Peddlers' license.** State license, general provisions. **N. Y. 376, 22 Ap**
- 438 State fee \$200, in addition to local fee of \$100 to \$350. Deposit.** **B. I. 326, 7 My**
- 439 Increasing fees and restrictions.** **La. 78, 9 Jl**
- 440 Veterans to receive license free.** **N. Y. 371, 22 Ap**
- 441 Right to free license extended to veterans of Indian and Mexican wars. Veterans must be residents of state.** **Ga. p. 19, 14 D '95**

- 442 Farm produce; repealing requirement of permit for sale.
N. J. 38, 12 Mr
- 443 Farm produce; municipalities may not require license.
Va. 625, 3 Mr
- 444 Municipalities may not require license of persons selling meats raised by themselves, not in regular market. S. C. 43, 7 F
- 445 Photographers. License need be paid in only one county.
Ga. p. 13, 16 D '95
- 446 Publishers. After paying license as such, exempt from tax as book agents. Va. 541, 29 F
- 447 Brokers. Changing rates and extending to other classes.
Md. 144, 4 Ap
- 448 Boarding-houses. Amending law. Va. 850, 5 Mr
- 449 Taxes on deeds, etc. Fee of tax commissioners collected by clerk of court on recording deed. Va. 510, 27 F
- 450 Dog licenses. Societies for prevention of cruelty may license in cities, and kill if unlicensed. N. Y. 448, 7 My
- 451 May be fixed by permanent instead of annual resolution. Time of payment. Dog wardens. N. J. 158, 9 Ap

Local finance^a

- 452 Taxes. Maximum rates for municipalities of various sizes. Surplus of liquor revenue transferable to other funds.
O. p. 312, 24 Ap
- 453 Submitting to people constitutional amendment that legislature may authorize levy of taxes based on income, licenses or franchises (1897). Ky. J. Res. 7, 17 Mr
- 454 All local, school and municipal taxes to be based on same assessment as state taxes (which is made by county auditor).
S. C. 28, 9 Mr
- 455 Debt. Submitting constitutional amendment limiting county, municipal and school district indebtedness to five per cent of valuation. *Not voted on for lack of proper submission.*
Ore. p. 611, 4 F '95
- 456 Submitting constitutional amendment defining application of limitation on parish and municipal debt. *Rejected by people, 1896.*
La. 192, '94

^a Only the *purely* financial matters are here placed. Authorizations of taxes, assessments, bonds, etc. for special municipal purposes—schools, libraries, light, streets, etc. are classified under those heads. They are however also *indexed* under taxes, etc. Miscellaneous provisions as to assessment and collection of taxes in local bodies are under Taxation, as such provisions usually apply to all classes of taxes. Provisions relating to election, term of office, etc. of financial officials are under Local government, but those relating solely to their financial duties are placed here. See particularly Special assessments, 1024; School finances, 92; Manufacturing, 1430.

- 457** Submitting constitutional amendment extending debt limit of any county, city or subdivision for water for irrigation or domestic purposes on popular vote. *Adopted by people, 1896. See footnote c, p. 408.* S. D. 35, 96
- 458** Proposed constitutional amendment that general assembly may authorize towns and cities to contract debts or levy taxes for parks, roads and bridges. *Rejected by people, 1896.* La. 201, '94
- 459** Election on issue of bonds for any purpose must be held when majority of freeholders of municipality petition. S. C. 41, 9 Mr
- 460** Clerks of various local bodies to certify that bonds and warrants do not exceed debt limit. Utah 22, 21 F
- 461** Bonds may run not over 20 [formerly 7] years. O. p. 6, 3 F
- 462** County chosen freeholders may establish and appoint sinking fund commissioners. Powers. N. J. 218, 2 Je
- 463** Management of sinking funds created to put counties on a cash basis as to running expenses. When equal to one year's expenses, to go to general fund. S. C. 33, 9 Mr
- 464** Township sinking fund commissioners; increasing powers. Authorized cancelation of bonds held. N. J. 44, 17 Mr
- 465** Funding and refunding bonds. Any local body may refund debt now outstanding. Payment may be enforced by *mandamus*. S. C. 40, 9 Mr
- 466** Townships, school districts and counties may issue when necessary to prevent taxation beyond legal limit. Restrictions. O. p. 6, 3 F; p. 33, 20 F
- 467** Funding act extended to cities of 2,000 to 15,000. Bonds to be payable in *three* [formerly 5], due in *15* [formerly 20] years. Ia. 16, 8 Ap
- 468** Resolution for issue to describe the obligations refunded. Interest not to exceed *six* [formerly 8] per cent. O. p. 170, 16 Ap
- 469** Resolution declaring refunding bonds to be issued for a valid indebtedness shall protect holder though such original debt not valid. O. p. 368, 27 Ap
- 470** Cities and towns (townships); act amended. Mass. 269, 13 Ap
- 471** Funding bonds of cities; amending form as to date before maturity when they may be paid. Ia. 18, 3 Ap
- 472** Expenditures and appropriations. No local authority shall make contracts, obligations or appropriations unless money is in treasury or has already been levied. Moneys so set aside not to be used for other purposes. O. p. 341, 27 Ap

- 473 Authorizing and regulating transfers of unexpended appropriations in case of all municipalities, counties, etc. O. p. 77, 17 Mr
- 474 Counties; certain fixed obligations may be paid though appropriation exhausted. Transfer of balances. Explanation of increased estimates. Mass. 357, 1 My
- 475 Cities; mayor may veto specific appropriation items. Utah 79, 2 Ap
- 476 Power of authorizing town expenditures given to *town board* [formerly town auditors]. N. Y. 85, 11 Mr
- 477 Towns may appropriate money for Fourth of July. Mass. 152, 18 Mr
- 478 Gifts. Local authorities may accept gifts or bequests for special purposes, and appoint trustees to administer according to conditions. Ia. 20, 8 Ap; 66, 19 Mr
- 479 County depositories. Act regulating amended. O. p. 73, 17 Mr; p. 353, 27 Ap
- 480 County accounts. Supervisors must audit accounts and levy taxes at annual meeting *or within 60 days thereafter*. Va. 244, 6 F; 344, 17 F
- 481 Officers shall certify to or take proof of claims against counties without charge. S. C. 117, 9 Mr
- 481a Accounts of county treasurer rendered *yearly* [formerly quarterly]. Need not be published in newspapers. N. Y. 281, 17 Ap

Property and contract rights

(For all actions at law concerning these rights see Civil procedure. See also Alien land ownership, 176)

Possession and transfer

(Provisions mostly relate to *real* property, unless specified. See also Title insurance 1285)

- 482 General real property law. Tenure, estates, conveyances, recording. Uses and trusts, powers. Descent, dower. Landlord and tenant. N. Y. 547, 12 My
- 483 Estates. Titles. Possession of estate without notice of other evidence of title not valid notice against subsequent purchasers. Va. 758, 4 Mr
- 484 Entailed and conditional estates; when sold by order of court money may be invested in bonds secured by property sold. O. p. 323, 27 Ap
- 485 Boundaries. (See also Fences, 1487) True meridian; petition not necessary to enable supervisors to secure establishment. Miss. 140, 23 Mr

- 486** Plats; owners wishing to lay out lands in town lots must file.
La. 134, 9 JI
- 487** Registry of land titles. General law authorizing Torrens simplified system of registering titles and making transfers. Assurance fund.
O. p. 220, 27 Ap
(The Illinois act of 1895 on this subject has been declared unconstitutional)
- 488** Commission to examine Torrens system.
Utah 103, 5 Ap
Md. 84, 23 Mr
- 489** Acknowledgments. May be taken by clerk of any court of record within or without state, by an ambassador, or by their deputies. Form when made in any representative capacity.
Va. 526, 28 F
- 490** Before what officers may be taken outside state. Ga. p. 73, 22 N '95
- 491** Outside state may be before any notary, without proof of his official character except seal.
La. 140, 9 JI
- 492** Record of conveyances. Conveyances to receive consecutive file numbers and to be indexed daily with reference to such numbers. Alphabetic register to be made daily. Record later.
O. p. 267, 21 Ap
- 493** Instrument valid against subsequent claimants when recorded within 10 [formerly 20] days after acknowledgment.
Va. 250, 6 F
- 494** Register of mesne conveyance; office abolished; duties devolve on clerk of court.
S. C. 58, 25 F
- 495** Compensation of assistants of register of deeds to be approved by county commissioners.
Mass. 172, 21 Mr
- 496** Amending law as to indexes; expense, how estimated. Reports of number of records, etc., no longer required. Mass. 443, 28 My
- 497** Land contracts. Requiring 30 days notice by vendor before forfeiture of contract for sale of land on account of non-performance by vendee.
Ia. 73, 7 Mr

Family property (*See also* Support of family, 9; Dower, 586)

- 498** General law; rights of married women. N. Y. 272, 17 Ap
- 499** When wife insane, husband may convey property acquired by him since the insanity as if unmarried. Md. 243, 4 Ap
- 500** If husband and wife have lived apart seven years, either may convey separate real estate without the other. N. J. 83, 24 Mr
- 501** Married women. May make contracts as if single, with same liabilities. R. I. 335, 14 My
- 502** May deposit, etc., with banks as if single. La. 63, 8 JI

- 503 Separate real estate liable on their contracts, but may not be sold if rents and profits will discharge lien in five years. Va. 464, 24 F
- 504 Insurance, if payable to married woman, shall be free from claim of husband or his representatives or creditors except as to amount of premiums paid in fraud of creditors. N. J. 163, 14 Ap
- 505 Homestead and exemptions. Increasing value and otherwise extending privileges. To what cases not applicable. Procedure. Utah 71, 28 Mr
- 506 General amendments. \$300 personal exemption for person not a householder. S. C. 77, 9 Mr
- 507 Payments to holder of policy in accident or sick benefit insurance company exempt. Va. 643, 8 Mr
- 508 Penalty for sending claims out of state for collection by attachment or garnishment with view to deprive of exemption rights. Va. 286, 11 F
- 509 No lien on exempt personalty may be created except by written instrument signed by husband and wife. Ia. 84, 10 Ap
- Eminent domain** (*See also* Condemnation proceedings, 768; also special purposes, railways, etc. Index)
- 510 Over land or water rights for mining, irrigation and electric works. Procedure. Utah 95, 5 Ap
- 511 Over land of another for roads, tramways, canals and ditches to connect with similar works. La. 54, 9 Jl
- 512 Where same property held by two or more different estates, gross value of all estates may be paid by commissioners of estimate to trustees, to be by them held or distributed. N. J. 206, 12 My
- 513 Constitutional amendment, that private property may not be "destroyed or damaged" [now only "taken"] without compensation. *Adopted by people*, 1896. Minn. 5, 23 Mr '95

Liens. Incumbrances

(*See also* Railway mortgages, 1293; Foreclosures, 759)

- 514 Liens and mortgages generally. Extension or renewal must be entered on margin of record by creditor, debtor or trustee, attested by clerk. Miss. 98, 19 Mr
- 515 No action, attachment or execution valid against subsequent purchaser of real estate till notice filed with county clerk. Ky. 11, 17 Mr
- 516 Release; fee of clerk for entering on margin, 25 cents. Va. 536, 29 F

- 517 Landlords' crop mortgages may be foreclosed before due if legal process in favor of another person is being enforced on such crops. Ga. p. 25, 16 D '95
- 518 Deeds of trust. Sales under, by substituted trustees not valid unless record of substitution made. Miss. 96, 3 Mr
- 519 Sale of land under, must be in county where located or where grantor resides. Miss. 103, 23 Mr
- 520 Mechanics' liens. May be had on contracts with contractors or others representing owner. To be valid against mortgage or other lien unless notice filed with county clerk. Other amendments. Ky. 29, 21 Mr
- 521 Sub-contractors have lien. Regulations. S. C. 82, 25 F
- 522 Laborers, sub-contractors and material-men have first lien on money received by contractor — no lien on owner. Contractor may be fined for non-payment. S. C. 84, 2 Mr
- 523 Assignment of debt due by owner to general contractor not valid unless sub-contractors, supply-men and laborers are paid. Va. 351, 17 F
- 524 Assignments, etc., relating to building contracts must be recorded. N. Y. 915, 27 My
- 525 Court may discharge lien, if paid, when claimant and attorney are dead. N. J. 65, 19 Mr
- 526 Liens on city buildings may be discharged by deposit by contractor. N. Y. 682, 15 Ap
- 527 Attorney's fee, not over \$25, may be recovered. Utah 101, 5 Ap
- 528 Hotel-keepers. Lien on baggage of guest. Enforcement. Penalty for defrauding hotel-keepers. Ky. 12, 17 Mr
- 529 Rights as to baggage of guests extended to all persons letting lodgings or boarding. La. 29, 35, 6 JI
- 530 May sell unclaimed goods of guest after six months without legal procedure. Notice. La. 28, 6 JI
- Other liens for services. (See also Commission merchants, 1407)
- 531 Stone workers and quarrymen. N. Y. 738, 19 My
- 532 Allowed for labor or materials for constructing railways. Va. 62, 16 Ja
- 533 Affidavits, warrant and bond for enforcing liens on crops for rent, labor or advances. S. C. 83, 9 Mr
- 534 Vessels; statement must be filed within 30 [formerly 4] days after sailing. Mass. 404, 15 My
- 535 Conditional sales. Cream separators may be sold. N. Y. 601, 13 My

Other obligations and contracts

- 536 **Usury.** (*See also* Pawnbroking, 1425) Where person has loaned money at over six per cent but permits renewal at six per cent, plea of usury barred after one year. Va. 130, 23 Ja
- Negotiable instruments** (*See also* Legal holidays, 1418)
- 537 One or more of joint debtors may be released by creditor on payment of their share of debt. Utah 37, 7 Mr
- 538 Days of grace abolished. O. p. 61, 12 Mr
Md. 106, 27 Mr
- 539 Days of grace abolished except on sight drafts. Mass. 496, 5 Je
- 540 Regulating use of stocks as collateral. Ia. 81, 14 Ap
- 541 **Saturday half-holiday.** Established in cities over 50,000.
O. p. 208, 21 Ap
- 542 Banking hours on Saturdays end at noon. Va. 827, 5 Mr
- 543 **Landlord and tenant.** General provisions. N. Y. 547, 12 My
- 544 Repealing law allowing leases to be filed in court and providing for their enforcement. Ga. p. 29, 14 D '95
- 545 **Covenant to restore premises in good repair not to cover loss by fire without negligence of lessee, unless specially stipulated.**
Md. 19, 6 Mr
- 546 **Uses and trusts.** (*See also* Deeds of trust, 518; Insolvency, 560) General provisions. N. Y. 547, 12 My
- 547 Where new trustees required for any reason, *any party* in interest may in certain conditions apply for his appointment.
B. I. 346, 15 My
- 548 Foreign trustees and guardians may institute suits or sell property on filing copy of letters. Must give security or pay claimants before removing assets. Ga. p. 85, 16 D '95
- Sureties.** (*See also* Surety companies, 1280; for special provisions as to officers etc. see Index, heading Bonds)
- 549 After one year from final account of any fiduciary, court may discharge sureties on bond. N. J. 72, 23 Mr
- 550 Liability of surety may be limited as he may require.
Va. 170, 28 Ja; 208, 30 Ja
- 551 **Fiduciaries' bonds;** reasonable amount paid to surety company to be allowed from trust property. O. p. 320, 27 Ap
- 552 **Hotelkeepers' liability.** Not to exceed \$500, except by special arrangement, as to valuables. Limit as to other property.
O. p. 322, 27 Ap
- 553 **Registers must be kept in certain cases.** N. Y. 588, 12 My

- 554 Partnerships.** With fictitious names; banking and commercial partnerships and joint-stock companies may file statements signed by officers only. O. p. 328, 27 Ap
- 555** With fictitious names; requirement of publication of names of partners repealed. O. p. 25, 13 F
- 556 Court contracts.** Law providing for filing contracts for service or for rent of land in court and for enforcing them, repealed. Ga. p. 29, 14 D '95

Insolvency

(See also Preference of wages, 371; Insolvent corporations, 308, 331, 1254; Taxes, 389; Credit insurance, 1287)

- 557** Amending as to acts constituting insolvency and as to fraudulent conveyances and preferences. Md. 446, 4 Ap
- 558** Insurance effected by a person on his own life or another's, valid in favor of person to whom payable as against person effecting, except as to amount of premiums paid in fraud of creditors. N. J. 163, 14 Ap
- 559 Assignees.** Report as to distribution of estate to be made every six months. N. J. 122, 26 Mr
- 560** Trustees on deeds of trust to sell for benefit of creditors to have same compensation as assignees. N. Y. 249, 15 Ap
- 561** Sale of land. Court may authorize land of debtor intended for sale to be laid out in town lots. O. p. 324, 27 Ap
- 562** Adjustment of cash or deferred payments. O. p. 31, 19 F
- 563** Discharge. Form of affidavit in petition for. N. Y. 278, 17 Ap

Estates of decedents

Descents and devises

(See also Taxes, 376; Collateral inheritance tax, 410)

- 564 Descents.** Real property; general provisions. Dower. N. Y. 547, 12 My
- 565** On petition after due notice and citation, court may declare persons appearing in court to be sole heirs of intestate. Effect. Miss. 93, 19 Mr
- 566** Dower and curtesy. Some provision for sale of unimproved lands where interest can not be equitably assigned in case of widower as of widow. O. p. 314, 27 Ap
- 567** Assignment of dower may be made on motion of heir or *allenee*. Va. 270, 11 F

- 568 Dower, one third of estate. Various rights defined. Utah 118, 5 Ap
- 569 Same provision for conveying right of curtesy of insane husband as right of dower of insane wife. Va. 228, 5 F
- 570 Wills. Typewriting valid. O. p. 189, 17 Ap
- 571 Olographic wills; judge to interrogate witnesses and make sure that they know handwriting. La. 119, 9 Jl
- 572 Validity of wills. Appeals to supreme court; judgments by default; judgment in favor of validity to enjoin further action impeaching it. N. Y. 943, 27 My
- 573 Escheated lands. Regulating sale. S. C. 76, 9 Mr

Probate procedure. Administration

(See also Civil procedure, 660, 664, 695, 757)

- 574 Probate courts. Duties of probate judges conferred on district courts. Utah 27, 24 F
- 575 Repealing act (1895) providing that judges of county court shall be judges of orphans' court. N. J. 157, 9 Ap
- 576 Blank forms to be furnished by state auditor. R. I. 313, 15 Ap
- 577 Judges and registers of probate and insolvency to receive traveling expenses when court away from county seat. Mass. 316, 27 Ap
- 578 Powers of clerk of district court in probate cases when judge absent. Utah 43, 11 Mr
- 579 Probate procedure. Notices to be given *by clerk, on application*. R. I. 317, 23 Ap
- 580 Citation may be waived by recorded instrument. N. Y. 570, 12 My
- 581 Hearings as to estates of decedents or wards may be by district judge at chambers. Utah 114, 5 Ap
- 582 Appeals to supreme court from orders of district court relating to estates. Time limit. Undertaking. Utah 110, 5 Ap
- 583 Probate bonds; wife of probate judge may be defendant in suit. Mass. 208, 25 Mr
- 584 Executors and administrators. Where dispute as to right to receive letters, court may appoint temporary administrator to act at hearing. Utah 78, 2 Ap
- 585 Appraisement to accompany original inventory instead of being made thereafter. R. I. 308, 31 Ja
- 586 When estate of small value, may be only one appraiser. Mass. 210, 26 Mr

- 587 Amending law as to notice to creditors and others of intention to settle debts according to schedule. La. 51, 7 Jl
- 588 Burden of proof that claim is unpaid not on claimant, but executors, etc., may examine him thereon. Ia. 75, 11 Ap
- 589 Legatee who has paid debt for which bequeathed realty was mortgaged has no recourse against heirs or legatees under universal title. La. 72, 9 Jl
- 590 Satisfaction of liens in case of sale of decedent's land for payment of debts. O. p. 155, 14 Ap
- 591 Notice of meeting of legatees, etc., for distribution of estates. Md. 255, 2 Ap
- 592 Estates of absentees. Authorizing appointment of executors or administrators for estates of persons absent and unheard of seven years. Procedure. Md. 248, 2 Ap

Guardianship

(See also Family, 11; Trustees, 548; Insane, 1163)

- 593 Chancellor in vacation may appoint clerk of court as guardian in certain cases. Miss. 92, 4 Mr
- 594 Real estate of ward may be leased longer than three years on order of court, but not over six years. Miss. 95, 23 Mr
- 595 Provision authorizing support of wards out of estate, extended to guardians by will or by deed. N. Y. 61, 3 Mr
- 596 Guardian may mortgage ward's real estate. Ia. 54, 10 Ap
- 597 Guardians of insane, etc. To deal with estate, give bonds, account, etc., as do executors and administrators [formerly as guardians of minors]. Miss. 97, 4 Mr
- 598 Claimant against estate not to witness as to claim arising before person became incompetent. Miss. 99, 19 Mr

Administration of justice

Practice of law

(See also 622, 637)

- 599 Admission to bar to be only by three or more judges of court of appeals on examination. Va. 41, 11 Ja
- 600 Barratry; definition amended; penalty. Ga. p. 64, 16 D '95
- 601 Disbarring; district attorney to prosecute cases. Expense. N. Y. 557, 12 My
- 602 Clerks and stenographers forbidden to disclose professional communications. N. Y. 564, 12 My

Courts—organization, jurisdiction

(Procedure, even though peculiar to special courts, is given according to its subject matter in Probate, Civil and Criminal procedure, not here. Courts are grouped according to their jurisdiction, notwithstanding variations in names)

- 603 Proposed constitutional amendments; jurisdiction of supreme court, district courts, justices of the peace, etc. *Rejected by people*, 1896.
La. 197, '94
- 604 Submitting constitutional amendment allowing legislature *by two-thirds vote* to create other courts inferior to supreme court [formerly allowed only in municipalities]. *Rejected by people*, 1896.
Neb. 110, 29 Mr '95
- 605 Supreme court. Organization and officers. Utah 7, 3 F
- 606 General constitution, officers and practice. Four justices instead of three. S. C. 3, 19 Ja
- 607 Constitutional amendment to increase number to *five* [formerly 3] *until legislature increase*; and to fix term at *five* [formerly 6] years till legislature change. *Rejected by people*, 1896.
Neb. 111, 29 Mr '95
- 608 Constitutional amendment that legislature may increase number and compensation by two-thirds vote once in four years. *Rejected by people*, 1896. Neb. 112, 113, 30 Mr '95
- 609 Constitutional amendment increasing number of associate justices to five, allowing two divisions, and providing for election by people. *Adopted by people*, 1896. Ga. p. 15, 16 D '95
- 610 Constitutional amendment increasing supreme court judges to *five* [formerly 3]. Legislature to divide state into circuits. *Not voted on for lack of proper submission*. Ore. p. 612, 6 F '95
- 611 Constitutional amendment defining jurisdiction more fully. *Rejected by people*, 1896. Mo. p. 286, '95
- 612 Fees of clerks of supreme court and of chancery to go to state. Salary fixed. N. J. 24, 5 Mr
- 613 Clerk and deputies may take oaths or acknowledgments. La. 189, 9 Jl
- 614 May hear and decide certain cases at chambers in vacation. La. 66, 9 Jl
- 615 Certain decisions of supreme court, appellate division, not appealable to court of appeals. N. Y. 559, 12 My
- 616 Court of appeals reports furnished to U. S. courts in state. Va. 777, 4 Mr
- 617 Supreme court judges to receive extra copy of reports for office, to be turned over to successors. R. I. 331, 13 My

- 618 Submitting to people constitutional amendment slightly modifying phraseology regarding publication of decisions and time of taking effect. *Adopted (?) by people, 1896.* Fla. J. Res. 1, 30 My '95
- 619 District courts. May be established in cities, *though under 20,000 population.* N. J. 108, 26 Mr
- 620 Submitting constitutional amendment that when judge is disabled, supreme court may appoint the judge of another district to fill his place. *Rejected by people, 1896.* La. 198, '94
- 621 Judges may preside in any other district court. N. J. 186, 30 Mr
- 622 Judges may practise law in any except district courts or cases appealed therefrom. N. J. 12, 3 Mr
- 623 Judges may fix terms. May issue open *venires* for jurors. Utah 1, 14 Ja
- 624 Where only one parish in district, there shall be six terms yearly, at least two jury terms. La. 64, 8 Jl
- 625 Clerks; term in cities shall expire one month after that of judge unless sooner appointed. N. J. 126, 26 Mr
- 626 Judge may appoint sergeant-at-arms. Salary, bond. N. J. 111, 26 Mr
- 627 Seal to be provided. Utah 15, 17 F
- 628 Superior court. May make rules as to printing trial lists and notifying attorneys. Mass. 401, 15 My
- 629 Supreme (district) court. (*See also* 615) Designation of justice to act on appellate division may be revoked at his request. N. Y. 113, 25 Mr
- 630 Appellate division; sheriff to furnish certain supplies, etc. N. Y. 407, 27 Ap
- 631 Two or more terms may be held in any county. Terms may be held in parts. N. Y. 561, 12 My
- 632 Appointment and pay of attendants and stenographers. N. Y. 647, 13 My
- 633 Inferior courts. Reducing number of judges and consolidating their duties. Salaries. N. J. 102, 26 Mr
- 634 Special courts of common pleas and general sessions. Providing for temporary establishment and designation of judges when courts overcrowded. S. C. 4, 9 Mr
- 635 Justices of peace. Supervisors may order election of three instead of two justices in any district, without establishing sub-districts. Miss. 134, 19 Mr
- 636 May act in other district of county when justice thereof disqualified. Ga. p. 49, 16 D '95

- 637 May act as attorneys in country parishes. La. 84, 9 Jl
- 638 Justices of peace and police have *exclusive* [formerly concurrent, or by request] jurisdiction in *all* misdemeanor cases.
Va. 845, 856, 5 Mr
- 639 Submitting constitutional amendment allowing justices same jurisdiction in counties where county court established as in other counties. *Adopted (?) by people*, 1896. Fla. J. Res. 4, 30 My '95
- 640 Jurisdiction extended to actions for damages for escape from jail liberties.
N. Y. 308, 17 Ap
- 641 Municipal courts. May sentence not over 30 days for violating municipal ordinances.
S. C. 19, 9 Mr
- 642 Legislature may abolish any court established by grand jury. Jury may change salary of judge.
Ga. p. 40, 16 D '95
- 643 Judges may punish disobedience to and enforce orders as in term time.
Va. 150, 27 Ja
- 644 Mayors of cities of 2,000 to 15,000, where no salary in lieu of fees, to receive same compensation as justices for acting as such.
Ia. 6, 14 Ap

Court officers—general

(For specific duties see their subject matter, and consult index; also 714, 747)

- 645 Peace officers. Fees in vagrancy case not over \$1. Ia. 99, 4 Ap
- 646 Fees for serving certain papers. B. I. 351, 15 My
- 647 Sheriffs. Jail expenses. Auditing accounts. To be paid monthly.
Miss. 138, 11 Mr
- 648 Police constables. Villages; to be paid by county when town constable would have been so paid.
N. Y. 457, 9 My
- 649 Court criers. Allowed mileage for attendance. N. Y. 439, 9 My
- 650 Prosecuting attorneys. Constitutional amendment establishing office in counties instead of in judicial districts. *Adopted by people*, 1896.
Ida. p. 236, 5 Mr '95
- 651 Attorneys for commonwealth. Limiting aggregate fees in any year.
Va. 608, 3 Mr
- 652 Masters in chancery. Women may be appointed if admitted to bar.
N. J. 133, 30 Mr
- 653 Stenographers. District court judges may hire by contract. Powers. Evidence of transcriptions. Payment by parties in civil causes.
Utah 75, 1 Ap
- 654 Circuit judges may appoint *in all counties*. Miss. 82, 7 Mr
- 655 Notaries public. Governor to appoint for two years.
Utah 5, 31 Ja

- 656 Any woman over 21 may be appointed special commissioner with powers of notary public. **Mass.** 476, 4 Je
- 657 May act in other district of same county when notary thereof disqualified. **Ga.** p. 49, 16 D '95
- 658 Coroners. Appointed *by county or corporation court* [formerly by governor from two nominees of court]. **Va.** 636, 3 Mr
- 659 Fees of physicians for *post mortem* examinations. **S. C.** 121, 25 F

Civil procedure—general

(Including such provisions as apply to both civil and criminal cases)

- 660 Limitation of actions. (*See also* 765) Against executors or administrators; act amended. **N. Y.** 897, 26 My
- 661 Actions for damages for seduction, criminal conversation or malicious prosecution must be brought in two years. **N. Y.** 335, 20 Ap
- 662 One year after *death of party* [formerly after qualification of personal representative] excluded. **Va.** 292, 12 F
- 663 Parties. Procedure to bring in new; to have same time to prepare as original parties. **Ga.** p 47, 16 D '95
- 664 Foreign executors or administrators may bring action on filing copy of letters, or may become parties instead of deceased to an action already begun. **N. J.** 119, 26 Mr
- 665 Place of action. General provisions. Change of venue. **Utah** 17, 17 F
- 666 Where defendant has contracted to do an act in another county, action may be brought in that county or county of residence. **Utah** 93, 4 Ap
- 667 When trial may be before justice and special justices in inferior courts. **Mass.** 220, 28 Mr
- Service of process.** (*See also* designation of agents, 845, 1261; Fees, 646, 749)
- 668 When defendant in one county and property attached in another, or when two or more defendants in different counties, what officers may serve process. **R. I.** 349, 15 My
- 669 In actions for possession or where value exceeds \$100, sheriff or deputies of county where brought may serve. **R. I.** 401, 28 My
- 670 When constable unable to act, justice of peace may employ sheriff or deputy in execution of conservative writs in civil suits. **La.** 92, 9 JI
- 671 In case no place of residence can be found, court may direct manner of service. **N. Y.** 562, 12 My
- 672 Cases where service on non-resident or unknown person may be by publication. **Ga.** p. 42, 14 D '95

- 673 Chancery cases; notice of suit against non-resident may be served personally. Proofs. Proviso. Md. 39, 10 Mr
- 674 Against fire insurance companies on local agent. Md. 367, 4 Ap
- 675 Against insurance companies may be on agent or on state auditor. Va. 416, 24 F
- 676 Civil arrest. Amending law. B. I. 299, 30 Ja
- 677 Person already arrested by constable on mesne process or execution may be again arrested by deputy sheriff on writ which constable could not serve. Mass. 247, 7 Ap
- 678 Answer. Where petition verified by oath answer must be. Answer may be amended substantially only when facts not known before. Answer may be in one paragraph. Ga. p. 44, 16 D '95
- Change of venue or judge (See also 621, 636)
- 679 How taken in civil and criminal cases before circuit or magistrates' court. S. C. 5, 12 F
- 680 If judge in superior court in cities can not act from sickness or other cause, judge to be appointed by mayor. Ia. 77, 24 Mr
- 681 When judge disqualified, clerk to appoint temporary judge instead of transferring case. Ga. p. 43, 14 D
- 682 Judges *pro tempore* may be appointed by stipulation of parties to an action. Utah 19, 17 F
- 683 Equity cases. (See also 652, 673, 702) Contingent interests of persons not in being or not ascertainable in cases relating to trusts or powers may be represented by person appointed by court, and decision is binding. B. I. 328, 12 My
- 684 Judge may appoint auditors of his own motion. Exceptions as to fact to be determined by jury. Ga. p. 47, 16 D
- 685 In circuit or corporation courts may be submitted to decision in vacation or judge may make interlocutory order or decree. Va. 151, 152, 27 Ja
- 686 Removal of cases from law to equity side of court or *vice versa*, or to another court, authorized when suit improperly brought in any court. Procedure. Md. 229, 4 Ap
- 687 Vacation hearings. Superior and city courts may, without previous order in term time, hear in vacation any matter not requiring jury. Ga. p. 46, 14 D '95
- 688 Preferred causes. Vacation of order for preference, how made. N. Y. 140, 27 Mr
- 689 Continuance. Judge to enter date on docket and to publicly announce continuance. Witnesses not paid during it. Ga. p. 41, 11 D '95

- 690 **Guardians ad litem.** Court may appoint for minor or absent party on petition of any person interested; decree in suit then binding. **Mass.** 456, 2 Je
- 691 **Arbitration.** Providing for allowing in any dispute. Appeal to circuit court. **S. C.** 78, 9 Mr
- 692 **Evidence. Witnesses.** Parties or witnesses dead or insane; use of former testimony. Notes of dead stenographers. **N. Y.** 563, 12 My
- 693 **Subscribing witnesses** need not be produced if party executing instrument testifies to its execution. **Ga.** p. 31, 16 D '95
- 694 **Where subscribing witness inaccessible,** proof of signature of maker to be primary evidence, and proof of handwriting of witness, etc., may be admitted if same unobtainable. **Ga.** p. 90, 16 D '95
- 695 **In actions against executors and administrators** certain statements by deceased admissible evidence. **Mass.** 445, 28 My
- 696 **Record or copy of record** valid evidence when instrument wanting. **Miss.** 102, 3 Mr
- 697 **Reporters of newspapers** not compelled to disclose source of information. **Md.** 249, 2 Ap
- 698 **Clerks and stenographers of attorneys** not to disclose professional communications. **N. Y.** 564, 12 My
- 699 **Witnesses' fees; by whom entered.** List sent to county or city treasurer. **Va.** 461, 27 F
- 700 **Witnesses allowed mileage** for attending grand jury. **La.** 17, 2 Jl
- 701 **Depositions; opposite party** may cross-examine. What notices required. **Ia.** 74, 8 Ap
- 702 **Chancery court** *must on application* or may of its own motion order oral examination before court instead of examiner. Other amendments as to such examinations. **Md.** 35, 11 Mr
- 703 **Jurors and jury service.** Revising general law. **La.** 99, 9 Jl
- 704 **General law, grand and petit jury.** **Ia.** 61, 14 Ap
Utah 52, 14 Mr
- 705 **Majority of board of county jury commissioners** may act. **S. C.** 8, 9 Mr
- 706 **Officers who are to be present at drawing.** **N. Y.** 342, 21 Ap
- 707 **Amending law as to duty of clerk of court and county board of commissioners in drawing jurors.** **S. C.** 9, 9 Mr
- 708 **Equal number (if possible)** to be drawn from each supervisor's district in county. **Miss.** 84, 23 Mr
- 709 **Notice of requirement of jurors to be served on town clerk by sheriff or deputy.** **R. I.** 25, 6 My

- 710 When address known and time sufficient *centre* for jurors and subpoena for state witnesses to be served by registered mail.
Utah 90, 4 Ap
- 711 Jurors may be held beyond period for which they were summoned till all cases disposed of.
S. C. 10, 25 F
- 712 Exemption of keepers of almshouses.
N. Y. 566, 12 My
- 713 Exemption of firemen in places over 10,000.
S. C. 12, 25 F
- 714 Exemption of all officers of courts.
Mass. 427, 21 My
- 715 Jurors' fees. Paid by county or city treasurer, and repaid by state.
Va. 460, 27 F
- 716 \$1 a day while in attendance, whether on jury or not.
Va. 746, 4 Mr
- 717 Tales jurors; pay same as regular jurors.
Ga. p. 74, 27 N '95
- 718 Constitutional amendment allowing civil verdict by five sixths of jury. *Rejected by people*, 1896.
Neb. 106, 29 Mr '95
- 719 Exceptions. Appeals. Review. Bills of exception may be served on defendant-in-error living out of state by mail.
Ga. p. 44, 14 D '95
- 720 Bills of exception in cases noted by a stenographer; act amended.
Miss. 83, 18 Mr
- 721 Jurisdiction of appeals from state board of claims.
N. Y. 451, 9 My
- 722 On constitutional questions if all four justices of supreme court do not agree, all judges of circuit court to be called in and majority of joint body decide.
S. C. 3, 19 Ja
- 723 Time when appellee shall be cited to appear. Notice.
La. 6, 23 Je
- 724 Original translation of shorthand evidence to be sent to supreme court instead of transcript thereof. Costs paid by losing party.
Ia. 64, 30 Ap
- 725 Transcript of charge to jury may be required by court.
Mass. 451, 2 Je
- 726 When cost of transcript and appeal is likely to exceed \$500, bond may exceed that sum.
Miss. 90, 3 Mr
- 727 Counties, cities and towns need not give undertakings.
Mass. 355, 1 My
- 728 Stay of judgment; judgment to bear interest at same rate as if stay not taken.
Ia. 90, 30 Ap
- 729 Judgments. When judgment by default may be reopened. Where judgment taken, plaintiff must affirmatively prove amount of damages.
Ga. p. 44, 16 D '95

- 730 Procedure in case of motion for judgment without trial in cases where an action of assumpsit would lie. Va. 110, 23 Ja
- 731 Confession of judgment for stay of execution inoperative unless approved as to form and security by clerk of court. Md. 207, 2 Ap
- 732 What to be evidence of enrolment. Miss. 101, 4 Mr
- 733 Time when judgment in courts of appeals goes into effect. Rehearing. La. 100, 9 Jl
- 734 Judgment to be lien on real estate *in county where given and entered* [formerly, in district]. Utah 21, 18 Ja
- 735 Judgments of U. S. courts to be lien when filed with county recorder. Utah 115, 5 Ap
- 736 Actions on judgments may be brought after 10 years from docketing. N. Y. 568, 12 My
- Executions. Judicial sales** (*See also* Preference of wages, 272; Taxes, 419; Exemptions, 505; Liens, 515)
- 737 Providing procedure before justices of peace to compel payment to judgment creditor of money due debtor. O. p. 375, 27 Ap
- 738 Special proceedings; remedy extended to party awarded costs. N. Y. 176, 1 Ap
- 739 Person claiming property seized by sheriff on execution or attachment must sue within two months. Sheriff to give notice to probable claimants. N. J. 212, 12 My
- 740 Levy considered as made *when land is taken*. Mass. 464, 3 Je
- 741 Amending as to procedure for releasing property levied on when it is claimed by another. Va. 269, 11 F
- 742 Constable may appoint keeper for property seized [formerly required consent of debtor.] La. 19, 2 Jl
- 743 Postponement of judicial sales in case of absence of officer. N. Y. 152, 27 Mr
- 744 Notice of judicial sales may be in newspaper of village only partly in county. N. Y. 567, 12 My
- 745 Redemption of real estate sold on execution; interest to be *at rate in original contract* [formerly at 10 per cent]. Ia. 65, 30 Ap
- 746 When time for redemption passed, officer making sale, or sheriff, may give deed. Utah 66, 28 Mr
- 747 **Costs. Fees.** Payment of or security for officers' fees may be required in advance except in criminal cases. Va. 326, 14 F
- 748 Treasurers of cities and counties may not enforce collection of fee-bills. Bills must be presented within two years. Va. 368, 18 F

- 749 Costs for procuring order for service of summons by publication or for service outside state. N. Y. 226, 8 Ap
- 750 Referees' *per diem* compensation in courts of record \$10 [formerly \$8]. N. Y. 90, 11 Mr
- 751 Funds paid into court. State comptroller may require papers from court clerks. N. Y. 269, 15 Ap
- 752 Obscene trials. Judge *in any court* may clear court. Ga. p. 49, 16 D '95
- 753 Contempt of court. District court may punish as does supreme court. B. I. 348, 15 My
- 754 Oaths. Placing hand on Bible required. In case of Hebrews on the Pentateuch. Md. 113, 27 Mr

Civil procedure—special actions

- 755 Real actions. Person claiming estate in remainder to which another lays claim may bring suit to quiet title. Procedure. N. J. 167, 14 Ap
- 756 Ejectment; any person claiming adverse title or interest may be made party. Va. 497, 27 F
- 757 Parties and procedure when estate of decedent is divided. N. Y. 277, 17 Ap
- 758 Partition; where made by licitation, rights of creditors against any co-proprietor remain against proceeds of sale. La. 86, 9 Jl
- 759 Foreclosure; consent of debtor to amount of mortgage must be made not more than one year before sale. If debt exceeds price of sale, balance not extinguished though mortgagee bids in lands, notwithstanding agreement. S. C. 79, 9 Mr
- 760 Foreclosure sales; repealing requirement that mortgagee must give special notice of his intention to bid in at sale. B. I. 327, 12 My
- 761 Foreclosure affidavit may be before any officer authorized to take oaths, but process must issue from officer authorized to issue it. Ga. p. 91, 16 D '95
- 762 Amending as to foreclosure of power of sale mortgages. Mass. 203, 25 Mr
- 763 Condemnation of land by railways; court to confirm finding of jury after 30 days if no sufficient cause to contrary. Md. 151, 2 Ap
- 764 Person injured by fraudulent conveyance of realty may bring petition in equity which shall act as *lis pendens*. Ky. 7, 16 Mr

Action for personal injury (*See also* 661; Streets, 1023; Roads, 1100)

- 765** Limitation two years. N. J. 77, 24 Mr
- 766** Extending right to brothers and sisters of deceased in case of death. Employers. Distribution of moneys recovered among relatives. Miss. 86, 23 Mr
- 767** Undertaking to discharge attachment may be fixed by court at any amount deemed proper. O. p. 327, 27 Ap
- 768** Libel. Allowing retraction. Utah 32, 2 Mr
- 769** Attachment. (*See also* 668, 730) Adding grounds for attachment before debt due. Miss. 94, 23 Mr
- 770** Action against non-resident, where brought. If against resident may be removed to county of residence. Ia. 89, 19 Mr
- 771** Amending law as to time after which perishable goods or live-stock may be sold. Miss. 91, 3 Mr
- 772** Penalties for sending claims out of state for collection by attachment or garnishment with intent to deprive debtor of exemption rights. Va. 236, 11 F
- 773** Actions on contract. Counterclaim by defendant; act amended. May be made although contract under seal. N. J. 131, 30 Mr
- 774** Actions for debt. Two or more persons with claims for labor less than \$20 each may unite. Mass. 444, 28 My
- 775** Change of names. Only one publication of notice necessary. Fee of probate judge \$3. O. p. 23, 19 F
- 776** Writs of prohibition and mandamus. May be issued by court of appeals at any place of session. Va. 117, 23 Ja
- 777** Injunction. Court may limit duration. Renewal or dissolution. Appeals. Va. 670, 3 Mr
- 778** Actions against illegal or foreign corporations. N. Y. 963, 28 My
- 779** Public office. Appeals involving title may be heard immediately. N. Y. 560, 12 My

Criminal procedure(*See also* numerous provisions of Civil procedure; also 638)

- 780** Commission to report on simplified pleadings and forms. Mass. Res. 113
- 781** Apprehension. Arrest. Where police officer in city or town has arrested offender in course of regular duty, no warrant need afterward be issued. Va. 396, 19 F
- 782** Arrest by officer outside county of residence; compensation; time of holding prisoner. Ga. p. 34, 13 D '95

- 783 Counties may keep two hounds. Use in certain cases to trace criminals. **Miss.** 139, 18 Mr
- 784 Identification. Prisoners in state prisons and penitentiaries to be described by Bertillon method. **N. Y.** 440, 9 My
R. I. 337, 13 My
- 785 Bail. How and by what courts taken. Appeals on refusal. Hearings may be in vacation. **Va.** 332, 14 F
- 786 Court may revoke or modify order requiring. **Mass.** 388, 12 My
- 787 Personal undertaking and deposit allowed in cases of violation of corporation ordinances. **N. Y.** 556, 12 My
- 788 Liability of sureties may be limited as they require. **Va.** 219, 1 F
- 789 Enforcement of collection of forfeited bail bonds when taken before justices of peace. **La.** 5, 28 Je
- 790 Cities; mayor may appoint commissioners with power to take bail in misdemeanor cases. **Utah** 88, 4 Ap
- 791 Prosecutions. If name of prosecutor has not been placed on indictment or information, court may order it entered of record at any time before judgment. **Va.** 32, 9 Ja
- 792 Prosecution by information authorized in all cases. **Form.**
Utah 23, 21 F
- 793 Preliminary examination; magistrate to return papers, etc., to court, when. **N. Y.** 280, 17 Ap
- 794 Grand jury. To consist of 13 to 23 persons. When to be 23. **B. I.** 309, 31 Ja
- 795 Lists of jurors to be filed with county clerk on or before December 10. **N. Y.** 34, 21 F
- 796 Change of venue. State has same right as defendant in certain cases. **S. C.** 5, 12 F
- 797 General procedure. Discretion of judge as to possibility of impartial trial. **Ga.** p. 70, 17 D '95
- 798 Witnesses. Repealing provision for commitment to Prison association. **Va.** 592, 2 Mr
- 799 Witness detained in default of bond may require his testimony to be at once taken in writing. Such testimony not to be used on trial if witness obtainable. **La.** 124, 9 Ji
- 800 Defendant's witnesses have same pay as state's witnesses, in felonies only. Subpoena in misdemeanor cases. **S. C.** 45a, 4 F
- 801 Jury. Special jury commissioner and jurors for criminal cases in counties over 500,000. **N. Y.** 378, 23 Ap

- 802 Submitting constitutional amendment providing that certain lesser offenses may be tried by jury of *six* [formerly less than 12] or by the court. *Rejected by people*, 1896. La. 197, '94
- 803 Misdemeanor cases; defendant may waive jury and submit to court. Va. 128, 23 Ja
- 804 In case of felony, *venire* to summon 16 [formerly 20] jurors. Va. 231, 5 F
- 805 On motion of attorney-general or attorney for defendant jury may not be allowed to separate till discharged. R. I. 347, 15 My
- 806 Appeals. Writs of error, where the commonwealth is not plaintiff in error, may be heard in vacation. Va. 75, 17 Ja
- 807 Where circuit court has reversed conviction by lower court, prosecution may appeal to supreme court. O. p. 187, 17 Ap
- 808 When objection made and bill of exceptions reserved, clerk to take down facts on which reserved, to be attached to bill if appeal taken. La. 113, 9 Jl
- 809 Sentences. Executions. (*See also* Penal institutions, 1217.) In felonies, with certain exceptions, on recommendation of jury approved by judge, penalty may be reduced. Misdemeanors how punished. Ga. p. 63, 27 N '95
- 810 Execution of criminals to be by electricity. Disposition of corpses. O. p. 159, 16 Ap
- 811 Imprisonment for fine; limiting duration. Judge in vacation may release. Va. 626, 3 Mr
- 812 Juvenile offenders. Procedure to put in custody of Prison association. Not to be over 21. Va. 507, 27 F; 592, 3 Mr
- 813 Criminal cases against children under 16 to have preference. N. Y. 414, 27 Ap
- 814 Amendments as to trial and place of confining persons under 21. N. Y. 553, 554, 12 My
- 815 Fees. Judges to report to auditor all allowances payable out of state treasury. Va. 609, 3 Mr
- 816 U. S. criminal cases. In cases removed from state to U. S. courts, officers and witnesses for the state to receive same pay as if called for U. S. Ky. 3, 5 Mr
- 817 Habeas corpus. Repealing provision that prisoner may be admitted to bail. Va. 313, 13 F
- 818 Feeding prisoners. Charge outside jail to be actual cost; in jail 20 cents a day. S. C. 108, 9 Mr

Crimes and punishments

(See also Public order and decency, 54-61; also various special offenses under subject; e. g. Elections)

- 819 **Manslaughter.** When wound is inflicted by person in this state on person in another state. Va. 570, 2 Mr
- 820 **Lynching.** Officer conniving to be prosecuted and removed. If death ensues county liable in any circumstances to \$2,000 damages, which it may recover from participants. S. C. 94, 8 F
- 821 **Penalty for interfering with sheriffs, etc., in discharge of duty.** Sheriff may be removed for failing to present facts to grand jury. Ga. p. 69, 16 D '95
- 822 **Giving right of action for damages against county to person injured by mob or to his heirs, and right to county against members of such mobs. Limit of amount recoverable \$5,000.** O. p. 186, 10 Ap
- 823 **Assault.** With intent to kill, rape or rob; penalty not over 20 [formerly 2] years. La. 59, 8 JI
- 824 **Rape. Age of consent. Raised to 14 [formerly 10] years.** S. C. 104, 9 Mr
- 825 **Raised to 14 [formerly 12].** Va. 611, 3 Mr
- 826 **Raised to 15 [formerly 13].** Ia. 70, 19 Mr
- 827 **Raised to 16.** La. 115, 9 JI
- 828 **Raised to 18.** Utah 12, 13 F
- 829 **Sodomy. Penalty 2 to 10 years [formerly life] imprisonment.** La. 69, 9 JI
- 830 **Burglary. (See also Burglary insurance, 1279) Penalty for breaking into cars.** Ia. 86, 2 My
- 831 **Penalty for knowingly making, mending or possessing burglar's tools.** B. I. 302, 31 Ja
- 832 **Amending definition of crime of breaking into or entering building, etc., with intent to commit crime.** Va. 33, 9 Ja
- 833 **Larceny. Person bringing property stolen outside state into state, punished as if offence wholly in state.** Va. 538, 29 F
- 834 **On railway cars; penalty.** Mass. 389, 12 My
- 835 **Stealing logs or lumber is larceny. Search.** Ia. 71, 19 Mr
- 836 **Stealing cattle; increasing penalty.** Miss. 85, 4 Mr
- 837 **Embezzlement. When officer probably guilty, governor shall direct proper officer to prosecute, and if indicted at once remove him from office.** S. C. 93, 25 F

- 838** Officer receiving money belonging to body or institution of which he is officer deemed to receive it by virtue of his office.
Ia. 67, 8 Ap
- 839** False pretenses. Penalty for false representations as to financial condition.
La. 106, 9 J1
- 840** Penalty for disposing fraudulently of goods bought on credit, etc.
La. 94, 9 J1
- 841** Malicious injury. Penalty for destroying or injuring wearing apparel or material therefor.
Md. 270, 4 Ap
- 842** Injury to harness or vehicles.
Ia. 87, 8 Ap
- 843** Injuring railways, canals, etc.; definition; reducing penalty. Extending law to shooting or throwing at train. Va. 858, 5 Mr
- 844** Penalty for injuring military or vessel property. N. Y. 552, 12 My
- 845** Vagrancy. Offenders may not be discharged on condition of leaving town.
Va. 783, 4 Mr
- 846** Exception of women from definition repealed. Unlawful riding on trains *prima facie* evidence.
Mass. 385, 9 My
- 847** Gypsies, tramps, etc., not to camp on highway over 24 hours without consent.
O. p. 88, 25 Mr
- 848** Disorderly conduct. Increased penalty after first offense in cities.
N. J. 210, 12 My
- 849** Misdemeanor to curse or use violent language to another concerning himself or his female relatives.
Va. 732, 4 Mr
- 850** Blackmail. Defining. Felony.
Md. 396, 4 Ap
- 851** Assisting prisoner to escape. Unlawful whether prisoner held with or without warrant.
Ia. 88, 2 My
- 852** Breaking jail. Same penalty whether before or after conviction.
Ia. 106, 17 Mr

State and local government

(See also Political regulations, 175 ; Finance, 353)

- 853** Public officers generally. (See also 779, 837, 1281) Must pay secretary of state \$5 for recording election or appointment and issuing commission.
O. p. 211, 21 Ap
- 854** General procedure to remove for malfeasance. Trial by jury as for felony.
Utah 31, 2 Mr
- 855** Vacancies in all district and state offices not provided for by constitution to be filled by governor.
Miss. 52, 18 Mr
- 856** Fees; disposition.
Utah 16, 17 F
- 857** Civil service. Submitting constitutional amendment requiring appointments to be after examination. (1807) Md. 459, 4 Ap

- 858 Act giving veterans preference amended and extended. Mass. 517, 9 Je
- 859 Remedy for refusal to give veterans preference, or for removal. N. Y. 821, 21 My
- 860 Preference to be given to U. S. citizens on public works, state and local. Mass. 494, 5 Je

State government

Officers. Civil service *See also* under special subjects — Railways, Insurance, Charities, etc.)

- 861 Constitutional amendment for *biennial* [formerly annual] election. *Rejected by people, 1896.* Mass. Res. 71, 17 Ap
- 862 Submitting constitutional amendment allowing creation of additional executive officers by three-fourths vote of members elected to legislature. *Rejected by people, 1896.* Feb. 109, 30 Mr '95
- 863 No state officer to appoint subordinate related to him within sixth degree. S. C. 60, 25 F
- 864 Submitting constitutional amendment allowing legislature to fix salaries. Not to change oftener than once in four years and only by two-thirds vote of members elected. [Now fixed in constitution.] *Rejected by people, 1896.* Feb. 108, 29 Mr '95
- 865 Establishing salaries. Utah 124, 5 Ap
- 866 When serving without compensation, pay no fee for commission. Utah 121, 5 Ap
- 867 Bonds; procedure for relieving sureties at their request. Miss. 51, 17 Mr
- 868 Governor. Defining powers and duties. Utah 34, 4 Mr
- 869 Proposed constitutional amendment, increasing salary to \$5,000. *Rejected by people, 1896.* La. 199, '94
- 870 Lieutenant-governor. Salary when office of governor vacant, \$8,000 per year. Mass. 347, 29 Ap
- 871 Secretary of state. Powers and duties; bond; fees. Public documents. Utah 61, 23 Mr
- 872 Certain fees. Utah 105, 5 Ap
- 873 State treasurer. Defining powers and duties; bond. Utah 53, 16 Mr
- 874 May close office Saturday at noon. Mass. 522, 9 Je
- 875 State auditor. Powers and duties. Bond. Utah 58, 19 Mr
- 876 Attorney-general. Powers and duties. Bond. Utah 38, 7 Mr
- 877 To appear for all state officers and departments; no special counsel. *Assistants.* Mass. 490, 5 Je

- 878 Assistant attorney-general; office established. O. 171, 16 Ap
- 879 State board of examiners. Governor, secretary of state and attorney-general. To act on claims against state. Procedure. To contract for supplies. Utah 85, 4 Mr
- 880 Bureau of immigration. Established. Collection of information; advertising, etc. Md. 295, 2 Ap

Miscellaneous provisions

- 881 Capital. Celebration of centennial of location at Albany. N. Y. 743, 19 My
- 882 Submitting to people question of removal to Sedalia, provided city erect buildings, etc. *Rejected*, 1896. Mo. p. 285, '95
- 883 State house. Appropriation for enlarging. O. p. 391, 27 Ap
- 884 Restoration and improvement of "Bulfinch" state house. Mass. 531, 9 Je
- 885 Cessions to U. S. General grant to U. S. of jurisdiction over lands hereafter acquired for official use. Governor to make cessions. Concurrent jurisdiction. N. Y. 391, 27 Ap
Ia. 111, 14 F
- 886 Governor may cede land for levees, etc., and for military parks. Miss. 67, 3 Mr
- 887 Tender of jurisdiction over certain Indians and their lands. Ia. 110, 14 F
- 888 Consent to acquisition of lands for fortifications. R. I. 330, 13 My
- 889 Ceding jurisdiction to U. S. over pallsades of Hudson river for military and national park, providing pallsades be preserved. N. Y. 15, 11 F
N. J. 23, 5 Mr
- 890 State institutions. (*See also* Charities, 1157; Penal institutions, 1198) Governing body may examine officers, compel testimony, take oaths, etc. Va. 177, 28 Ja
- 891 Commission created to facilitate interchange of products of their labor between the various prisons, hospitals, etc. O. p. 183, 17 Ap
- 892 Commissions, institutions, etc., may acquire land by condemnation. N. Y. 589, 12 My
- 893 Trustees may establish roads through lands, subject to approval of local authorities. Ia. 45, 14 Ap
- 894 State semi-centennial. Appropriation to celebrate. Ia. 116, 17 Ap
- 895 Celebration of arrival of pioneers. Utah 100, 5 Ap
- 896 State flag. Defining; use. N. J. J. Res. 2, p. 176, 26 Mr
- 897 Description established. N. Y. 229, 8 Ap

- 898 Great seal. Defining. Utah 86, 3 Ap
 899 State park. Part of St Lawrence river and islands therein made a state reservation. N. Y. 802, 20 My
 900 Immigration records. Transfer to U. S. bureau of immigration. N. Y. 467, 9 My

County and township government

(See also County finance, 457 ff, and specific functions of counties—roads, charities, jails drainage, etc.)

- 901 Counties. General system of government. Commissioners established instead of county court. Utah 131, 14 Ap
 902 Procedure to create new or consolidate counties or change county seat. Election; approval of legislature. S. C. 35, 9 Mr
 903 Classification to be based on federal census. N. J. 46, 17 Mr
 904 County officers. Fixing salaries according to valuation of county. Utah 124, 5 Ap
 905 Taxpayers suing for violation of duty shall receive back their costs. Prosecuting attorney's fees. O. p. 337, 27 Ap
 906 Must attend first charge of judge to grand jury after their taking office. Charge shall briefly instruct them on their duties. Miss. 81, 9 Mr
 907 County commissioners. To organize in September. To elect president in case of vacancy. O. p. 10, 6 F
 908 Report to be submitted on first day of first session of court of general sessions. S. C. 115, 9 Mr
 909 Penalty for delaying financial report. To be published in German newspaper. O. p. 188, 17 Ap
 910 Records of meetings, showing yeas and nays where not unanimous. Clerks *pro tempore*. Mass. 384, 9 My
 911 County treasurer. Bond, when given by surety company, need not exceed amount of annual receipts. Va. 621, 3 Mr
 912 Actions to recover moneys after end of term. N. Y. 937, 27 My
 913 County auditor. Empowered to collect public moneys. Ia. 100, 3 Ap
 914 County clerk. Seal to be provided. Utah 15, 17 F
 915 Fees must be paid in advance. N. Y. 572, 12 My
 916 Two additional deputies may be appointed in counties over 100,000. Duties of deputies. N. Y. 48, 29 F
 917 Light and heat of office paid by county. N. Y. 593, 12 My
 918 County engineer. Supervisors may employ. Miss. 135, 23 Mr

- 919 County attorney. To be furnished office but not law books by county. Ia. 83, 20 Ap
- 920 County printing and stationery. More detailed provisions as to contracts. To be let in state. Miss. 142, 19 Mr
- 921 Towns (townships). Consolidation with municipalities having same territorial limits. N. J. 182, 16 Ap
- 922 Division. Adjustment of debts and unpaid taxes. Actions, when allowable. N. Y. 459, 9 My
- 923 Officers may be removed by supreme court for malfeasance. N. Y. 573, 12 My
- 924 Township commissioners; compensation and mileage. S. C. 116, 9 Mr
- 925 Township commissioners to be *qualified electors* [formerly free-holders]. S. C. 114, 9 Mr
- 926 May erect public halls on popular vote. Tax. Ia. 26, 5 Mr
- 927 Townships over 15,000 may borrow money and erect buildings. N. J. 43, 17 Mr

Municipalities—Cities, towns, villages, boroughs

General — two or more classes (unless specified laws apply to all classes which exist in state)

- 928 Incorporation. Special act of legislature necessary for incorporation, but municipality to be governed by general laws. N. J. 117, 26 Mr; 153, 9 Ap
- 929 Change of class may be made on basis of census by local authorities. Miss. 166, 14 Mr
- 930 Boundaries. May increase or decrease territory on petition and popular vote. S. C. 38, 28 F
- 931 Inhabitants of annexed territory have same rights as if originally incorporated. La. 101, 9 Jl
- 932 Consolidation with townships having same boundaries. N. J. 182, 16 Ap
- 933 Requiring all cities and towns not already furnished to prepare and record maps of their streets and lots. La. 53, 9 Jl
- 934 Owners wishing to lay out lands in lots must file plats. La. 134, 9 Jl
- 935 Officers. Members of municipal or township governing body not eligible to appointment to office by such body. N. J. 78, 24 Mr
- 936 Veterans to be preferred in civil service. O. p. 50, 3 Mr

- 937 Wardens (aldermen) to be elected from and by voters of separate wards, and mayors or intendants by direct vote at large, in all cities and towns. S. C. 26, 9 Mr
- 938 Treasurer. To be elected by people. Miss. 168, 11 Mr
- 939 Solicitor. Must be attorney or counselor. O. p. 69, 13 Mr

Ordinances (*See also* Municipal courts, 641; Ball, 787)

- 940 Clerk or recorder to append to record certificate of date and manner of publication. Ia. 15, 4 Ap
- 941 If boundary adjoins railroad, the right of way shall be subject to municipal ordinances. O. p. 428, 27 Ap
- 942 Franchises. Penalty on holders for making charges in excess of provisions of franchise or contract. La. 112, 9 JI
- 943 Nuisances. Municipalities empowered to define and abate. O. p. 346, 27 Ap
- 944 Convict labor. Miscellaneous regulations as to employing municipal prisoners on streets and public works. S. C. 113, 9 Mr

Cities

- 945 Incorporation. Submitting to people constitutional amendment authorizing cities to frame their own charters. Board for framing. Limitations; legislature to pass other general limitations. Classification: less than 15,000; 15,000-50,000; over 50,000. *Adopted*, 1896. Minn. 4, 8 Ap '95
- 946 When majority of property owners present new charter with petition, election must be held. If carried charter becomes law. La. 135, 9 JI
- 947 Greater New York; Brooklyn and other subdivisions consolidated. Commission to prepare charter. N. Y. 488, 11 My
- 948 Charter for New Orleans. La. 45, 7 JI
- 949 Increasing powers of cities. Utah 59, 19 Mr
- 950 Submitting constitutional amendment authorizing merging of city and county when city exceeds 100,000. *Rejected by people*, 1896. Neb. 116, 29 Mr '95
- 951 City council. Term in cities under 10,000, two years. N. J. 146, 30 Mr
- 952 In cities over 40,000 having even number in council an alderman-at-large, to act as president, shall be elected. N. J. 81, 24 Mr
- 953 Members eligible to offices appointed by mayor only. Ga. p. 79, 13 D '95
- 954 Mayor. Vacancies; power in certain cases to devolve on an alderman elected by the board. Mass. 380, 9 My

- 955 Public buildings. Construction and bonds authorized.
N. J. 207, 12 My
- 956 If not regularly insured a fund therefor to be created by
investing annually one per cent of their value. N. J. 123, 28 Mr
- 957 Liens on, may be discharged by deposit of money by contractor.
N. Y. 682, 15 Ap

Towns, villages, boroughs

- 958 Incorporation. General law for towns of 1,000 to 5,000 hereafter
incorporated. S. C. 36, 5 Mr
- 959 General law, towns under 1,000. S. C. 37, 2 Mr
- 960 Villages and hamlets; township trustees on petition of 30 free-
holders may hold election for incorporation of territory.
O. p. 333, 27 Ap
- 961 Villages and hamlets may be incorporated though territory adjoin
city. O. p. 26, 18 F
- 962 Villages; permitting injunction against incorporation if boundaries
unreasonably large or small or causing injustice.
O. p. 196, 18 Ap
- 963 Villages; notice of election for incorporation must be signed by
15 per cent of voters [formerly by 20 voters]. Only taxpayers to
vote. N. Y. 923, 27 My
- 964 Villages; hours of election on question. N. Y. 209, 7 Ap
- 965 Repealing various acts for the incorporation of boroughs and
borough commissions and reconstituting bodies formed under
them as boroughs under act of 1878. N. J. 198, 21 Ap
- 966 Boroughs; declaratory act as to powers and bonds. N. J. 91, 25 Mr
- 967 Division of property and liabilities between townships and boroughs
set off from them. N. J. 183, 16 Ap
- 968 Wards. Reducing size in towns, boroughs and townships.
N. J. 98, 25 Mr
- 969 Officers. Term of town clerk, assessor and collector three years.
N. J. 23, 9 Mr
- 970 Villages; may be removed by supreme court for malfeasance.
N. Y. 573, 12 My
- 971 Villages may pay salaries though under 300 population.
Miss. 165, 19 Mr
- 972 Villages; president to appoint officers when trustees fail to act.
N. Y. 522, 11 My
- 973 Village councils; mayors to fill vacancies till the annual election [for-
merly for unexpired term]. O. p. 77, 17 Mr

- 974 Hamlets; bonds required of president of trustees, treasurer and marshal. O. p. 84, 19 Mr
- 975 Boroughs; enumerating elective officers of certain. Justices of peace to be township officers. N. J. 52, 53, 18 Mr

Police. Fire department

(See also Special police, 319, 323, 1318, 1444 ; Buildings, 1397)

- 976 Police and fire commissioners. Amending law establishing bi-partisan board in cities over 12,000. Utah 73, 30 Mr
- 977 Police. Cities may establish reserve police force subject to call for special duty. Mass. 314, 27 Ap
- 978 Amending act authorizing appointment by state when necessary to enforce liquor and other laws. Number and pay of force. Use of dispensary moneys. S. C. 42, 7 Mr
- 979 City police present on any race, fair or athletic grounds outside city shall make arrests when requested by managers. Va. 490, 27 F
- 980 Fire department. Tax levy in certain cities increased to three [formerly two] mills. Ia. 27, 29 F
- 981 Municipalities may exempt firemen from street tax or duty. Miss. 170, 23 Mr
- 982 Firemen exempt from jury duty, municipalities over 10,000. S. C. 12, 25 F
- 983 Cities and towns may appropriate money for care of graves and monuments, observances, etc., in honor of firemen. Mass. 455, 2 Je
- 984 Fire districts. Temporary loans in anticipation of revenue authorized. Mass. 280, 14 Ap
- 985 State firemen's association. Incorporated. Va. 343, 14 F
- 986 Appropriation in aid. Md. 57, 19 Mr

Light. Water. Power

- 987 Light and water. Constitutional amendment permitting increase over fixed rates of taxation, on popular vote, for cities under 30,000 to erect or purchase plant. *Rejected by people, 1896.* Mo. p. 289, '95
- 988 Cities and towns may erect water or light works. Bonds on popular vote. Sinking fund. S. C. 39, 2 Mr
- 989 Sale of municipal plant only after popular vote. Ia. 13, 4 Ap

- 990 **Municipal lighting.** Village electric plants in connection with waterworks may be placed under management of waterworks' trustees. O. p. 382, 27 Ap
- 991 Municipalities may make contracts for lighting streets not over 10 years. O. p. 290, 22 Ap
- 992 Lighting districts partly in two or more towns, outside of villages. N. Y. 309, 17 Ap
- 993 **Private companies.** State gas and electric light commissioners may require improvement of plant or reduction of capital for impairment, before issue of new stock or bonds. Mass. 473, 4 Je
- 994 Public or private plants to keep uniform station and plant records. Mass. 356, 1 My
- 995 Electric lighting companies, if furnishing public lights, entitled to eminent domain. N. Y. 446, 7 My
- 996 Electric companies have eminent domain. Utah 95, 5 Ap
- 997 May erect poles and wires on consent of owners of adjoining land and subject to direction and regulation of local authorities. Underground wires. N. J. 189, 21 Ap
- 998 Consent of municipality necessary for erecting light, heat or power wires. O. p. 204, 21 Ap
- 999 Accidents caused by gas and electricity to be reported to state board. Mass. 338, 28 Ap
- 1000 Gas and electric light commissioners. Certain courts to enforce orders. Mass. 426, 21 My
- 1001 Steam heat and power companies. Must obtain local authority's consent to lay pipes and be subject to regulations of such authority. Restrictions. N. J. 186, 21 Ap
- 1002 **Water supply.** (*See also* Irrigation, 1458) Formation of special water districts outside city or village. N. Y. 678, 15 My
- 1003 Villages may contract to furnish water to towns, fire districts or other villages. N. Y. 329, 18 Ap
- 1004 Certain villages may contract with companies for water for fire purposes. Restriction. N. Y. 978, 28 My
- 1005 Cities over 15,000 may purchase or construct waterworks on popular vote. Bonds, tax. Waterworks' trustees. Ia. 1, 4 Ap
- 1006 Cities under 12,000 may issue bonds to improve or repair. N. J. 51, 18 Mr
- 1007 Water bonds of villages; sinking fund may be invested in endowment insurance or certain mortgages. N. Y. 310, 17 Ap
- 1008 Pollution of water supply; act extended to all streams and to water companies. Mass. 252, 7 Ap

Local improvements

- 1009 **Streets and sewers.** Procedure for taking property in towns and villages. N. J. 155, 9 Ap
- 1010 **Opening and improving streets.** City council may open, alter or vacate streets or highways or accept land given for this purpose. N. J. 20, 5 Mr
- 1011 In cities over 100,000 not necessary to treat with owner before beginning proceedings for condemnation of land. N. J. 60, 19 Mr
- 1012 Villages; act amended as to appointment of commissioners to assess damages for opening of streets, etc. N. Y. 243, 15 Ap
- 1013 Incorporated towns over 15,000 may appoint superintendent of streets. N. J. 92, 25 Mr
- 1014 Cities over 15,000 may by ordinance improve streets and assess entire cost. Ia. 9, 17 Ap
- 1015 Cities over 10,000 may improve streets and assess two thirds cost on abutting property. La. 10, 26 Je
- 1016 Person injured by change of grade of street may recover damages by action. Utah 36, 7 Mr
- 1017 Cities of 12,000 to 100,000 may issue \$200,000 bonds for repaving streets. N. J. 57, 19 Mr
- 1018 **Streets — miscellaneous.** Municipalities may exempt firemen from street duty or tax. Miss. 70, 23 Mr
- 1019 Cities may contract not over five years for removal of ashes and garbage. N. J. 29, 9 Mr
- 1020 Erection of structures for public celebrations in cities over 250,000. N. Y. 823, 21 My
- 1021 Cities under special charter may sprinkle streets and assess cost. Ia. 10, 30 Ap
- 1022 Municipalities may prohibit use of barbed wire on streets. Ia. 17, 14 Ap
- 1023 Suit for injury by defect in streets and sidewalks must be within *three* [formerly six] months. Ia. 63, 14 Ap
- 1024 **Special assessments generally.** Any municipality may levy, on petition of majority of property affected, or, by three-fourths vote of council. Va. 729, 4 Mr
- 1025 May be paid in 10 annual interest-bearing instalments. Mass. 158, 18 Mr
- 1026 Money already paid on an assessment afterward annulled shall be refunded. N. Y. 910, 27 My

- 1027 Commissioners' reports of damages and benefits, when requiring approval of circuit court, shall afterward be filed with city comptroller. N. J. 214, 12 My
- 1028 Sidewalks. (*See also* State roads, 1060) Villages; one half cost of sidewalks built by private citizens may be repaid them in cash. N. Y. 458, 9 My
- 1029 Villages may issue certificates of indebtedness payable by annual tax instalments. N. Y. 341, 21 Ap
- 1030 Counties constructing improved roads may build sidewalks on such roads; half of cost to be assessed on adjoining property, half paid by county. N. J. 184, 16 Ap
- 1031 Cities over 15,000 may construct temporary sidewalks along land not divided into lots; assessment. Ia. 2, 14 Ap
- 1032 Sidewalk assessments collectable as ordinary taxes. May bear interest after 30 days. Mass. 251, 7 Ap
- 1033 Sewers. Cities of 2,000 to 5,000 may construct when majority of abutting owners petition, and assess cost. Ia. 7, 4 Ap
- 1034 Cities of 2,000 to 15,000 may take land within or without limits for outlet of sewer. Ia. 8, 4 Ap
- 1035 Amending law for sewers in boroughs, as to residence of commissioners and issue of bonds. N. J. 199, 12 My
- 1036 Act for construction in townships amended as to certificates of indebtedness. N. J. 197, 21 Ap
- 1037 Commission to consider general system for valley of Passaic river. N. J. 7, 26 F
- 1038 Drainage of New Orleans. Commission created. May borrow \$5,000,000. La. 114, 9 J1
- 1039 Cities may construct house connections at time of building sewers and assess cost on property. N. J. 107, 26 Mr
- 1040 Owners of houses must connect with sewers in street, under regulations of local boards of health. N. J. 203, 12 My
- 1041 Municipalities may regulate all plumbing on house connections. Ia. 14, 14 Ap
- 1042 Sewer assessments. Cost may be assessed on abutters in cities under 20,000, when majority of them petition for sewer. O. p. 197, 18 Ap
- 1043 By whom to be made in certain cases. N. J. 174, 14 Ap
- 1044 Assessments and rentals are liens on property for two years. Mass. 236, 1 Ap

- 1045 Collectable as ordinary taxes. City council may charge interest after 30 days. **Mass.** 251, 7 Ap
- 1046 Villages; assessments for cost, and for payment of bonds falling due. **N.Y.** 409, 27 Ap

Parks, boulevards

(See also State parks, 889, 899; Military parks, 1152)

- 1047 **Parks.** Establishing park commissioners in cities over 25,000. Powers; taxes; bonds. **Ia.** 19, 2 My
- 1048 Board of street and water commissioners in cities over 100,000 may acquire land for parks. Bonds. **N. J.** 148, 30 Mr
- 1049 Metropolitan parks; apportionment of cost among cities and towns; act amended. **Mass.** 550, 9 Je
- 1050 Cities and towns may prescribe distance of buildings from line of parks or boulevards, and limit their height, which shall not exceed 70 feet. **Mass.** 318, 27 Ap
- 1051 Fine for violating ordinances as to parks and boulevards. **Mass.** 199, 25 Mr
- 1052 Boroughs may levy tax for music in parks. **N. J.** 70, 23 Mr
- 1053 Extending act authorizing gifts and bequests for parks to be made to villages, so as to apply to towns. **N. Y.** 53, 29 F

Cemeteries

- 1054 May acquire land and rights for necessary water supply by condemnation. **N. Y.** 325, 18 Ap
- 1055 Increasing amount of land that may be held in counties containing cities over 5,000. **O. p.** 114, 1 Ap
- 1056 New lands not to be used in cities over 100,000 except by consent of council and board of health. **N. J.** 22, 5 Mr
- 1057 Reserved burial grounds exempt from taxation. **Va.** 178, 28 Ja

Roads and bridges

- 1058 **General law.** Township authorities given added power. General county tax of one mill may be levied, etc. **S. C.** 109, 23 Mr; 111, 9 Mr
- 1059 Townships may by popular vote improve roads by general tax and issue bonds. **O. p.** 63, 13 Mr
- 1060 **State roads.** State not to build or control sidewalks; how constructed. Local authorities to clean snow and ice. **Mass.** 345, 23 Ap
- 1061 State commissioner's salary \$1,500 per year. **N. J.** 100, 25 Mr

- 1062 State may loan towns steam rollers, stone crushers, etc.
Mass. 513, 6 Je
- 1063 Improved roads. On popular vote counties may buy and open toll roads or construct improved roads. Bonds. Ky. 27, 17 Mr
- 1064 County board may at discretion refuse petition of property-owners to improve road partly at cost of such abutting owners.
N. J. 168, 14 Ap
- 1065 Incorporated towns; legal voters may appropriate money for hard roads.
N. J. 98, 25 Mr
- 1066 Amending law as to levy of and exemption from assessments for improved roads.
O. p. 190, 17 Ap
- 1067 Certain counties to furnish broken stone free to townships and municipalities therein.
N. J. 79, 24 Mr; 120, 26 Mr
- 1068 Money for repair to be paid on order of township trustees.
O. p. 82, 19 F
- 1069 Act amended as to acceptance of roads built at private expense, and vacation of roads superseded by such roads.
N. J. 75, 23 Mr
- 1070 Road districts. Right to vote for road commissioner and on appropriations given to *legal voters* [formerly to freeholders]. Assembly to be held yearly. Commissioner to give bond.
N. J. 45, 17 Mr
- 1071 Road supervisors. Settlement with town trustees in *November* [formerly October].
Ia. 43, 3 Ap
- 1072 Road work. Two days' labor or \$3 may be required in road districts or municipalities.
O. p. 162, 16 Ap
- 1073 Submitting to next legislature constitutional amendment allowing requirement of two days annually of all 16 to 60 years old. *Not adopted by legislature of 1895-96.*
Va. 848, 8 Mr '94
- 1074 Required of persons 18 [formerly 15] to 50. Increasing fine for non-performance.
La. 117, 9 Jl
- 1075 Opening roads. Committee to report on advisability shall be chosen from road district concerned. Pay. Miss. 231, 23 Mr
- 1076 County roads; opening to be made by township trustees on order of county commissioners.
O. p. 156, 14 Ap
- 1077 Township authorities may agree with owner on price of land taken, or accept it as gift. Petition of special proportion of property affected not required.
N. J. 194, 21 Ap
- 1078 Costs on appeal from award of damages.
Ia. 44, 14 Ap
- 1079 Procedure for fixing compensation for land for county roads.
O. p. 103, 30 Mr

- 1080 Procedure for appraising damages from closing roads.
N. Y. 464, 9 My
- 1081 Working. Repair. Division of expense of repairing roads on boundaries of local divisions or municipalities.
N. J. 200, 12 My
- 1082 Temporary loans by counties for repair when suddenly destroyed. When maturity may be extended to 20 years. N. J. 145, 30 Mr
- 1083 Consent of taxpayers necessary to purchase road machines.
N. Y. 987, 28 My
- 1084 Bicycles. Rubber tires. (*See also* Taxation, 382; Transportation, 1817)
Penalty for putting in roads substances likely to puncture tires.
O. p. 157, 16 Ap
N. Y. 304, 17 Ap
N. J. 201, 12 My
B. I. 318, 23 Ap
Md. 487, 4 Ap
- 1085 Bicycle riders to use care in passing horses to avoid frightening; if necessary, to dismount. Va. 788, 4 Mr
- 1086 Local authorities may pass ordinances as to lamps, bells, speed, permits and use of sidewalks, and no others. N. J. 8, 3 Mr
- 1087 Townships may vote money to construct bicycle paths.
N. J. 62, 19 Mr
- 1088 Toll roads. Companies to report to county court annually, whether state or county have stock in them or not. Ky. 16, 17 Mr
- 1089 Procedure for enforcing repair. N. Y. 343, 21 Ap
- 1090 To permit certain persons to travel free, whether partly owned by state or county or not. Ky. 23, 17 Mr
- 1091 On popular vote counties may purchase or condemn and make free. Bonds. Ky. 27, 17 Mr
- 1092 State to sell interest to enable counties to make free.
Ga. p. 6, 16 Mr
- 1093 Abandoned turnpikes to revert to towns or municipalities, which must open and maintain. N. Y. 964, 28 My
- 1094 Miscellaneous regulations. Penalty for placing on roads or sidewalks glass, stones, etc., likely to injure persons, animals or bicycles. Broken stone used for repair to be covered over.
N. J. 201, 12 My
- 1095 Private roads; if passing through land of another, landowner may place gates across. Va. 666, 3 Mr
- 1096 Broad tires; increasing rebate allowable on taxes for persons using. N. J. 76, 24 Mr

- 1097 Drainage; surface water to be drained by natural channels. Supervisor may enter private property to clear such channels. Ia. 47, 14 Ap
- 1098 Hedges on highways; requiring biennial trimming. Enforcement. Ia. 48, 14 Ap
- 1099 Convict labor on highways; miscellaneous amendments. S. C. 111, 26 Mr; 113, 9 Mr
- 1100 Snow and ice; towns and cities not liable for injury if roads or sidewalks otherwise safe. Mass. 540, 9 Je
- 1101 Guide boards; townships must erect on petition of 10 freeholders. O. p. 378, 27 Ap
- 1102 Shade and fruit trees; prohibiting fastening animals to or in reach of. N. J. 162, 14 Ap
- 1103 Shade trees; towns may appoint three wardens for care. No public tree cut down without hearing. Mass. 190, 25 Mr
- 1104 Bridges. (See also Private bills, 241; Railways, 1296.) Expense of construction over navigable waters on county lines. Reconstruction of condemned bridges. N. Y. 995, 29 My
- 1105 Consent of U. S. authorities when waters under their control. N. Y. 778, 20 My
- 1106 Counties may cooperate with authorities in adjacent state in building. Ga. p. 78, 13 D '95
- 1107 Counties may pay part of cost of bridges in land whose jurisdiction is in U. S. Ga. p. 76, 27 N '95
- 1108 Authorities not liable for obstructing navigation by rebuilding or repairing between *November 1 and January 1*, in certain cases. N. J. 171, 14 Ap
- 1109 Misdemeanor to allow floating saw logs to block against bridge. La. 98, 9 JI

Military regulations

Militia. National guard

- 1110 General laws. Military code; revised and consolidated. Utah 84, 8 Ap
Md. 89, 27 Mr
Ia. 102, 10 Ap
- 1111 Amendments. Composition of company, troop, battery and regiment; pay of marshals; allowances for maintenance; armories and employees therein. N. Y. 853, 22 My
- 1112 Amending law as to batteries, signal corps, band, and number of privates. Ga. p. 96, 16 D '95

- 1113 **Officers.** Honorable discharge for reorganization allowed only after hearing before governor. **Mass. 425, 21 My**
- 1114 May be placed on retired list after 10 years service. **O. p. 383, 27 Ap**
- 1115 **Naval militia.** Eight companies established. Regulation. **O. p. 109, 31 Mr**
- 1116 Increasing number and reorganizing. **La. 107, 9 Jl**
- 1117 Act amended. Members qualified to become staff officers of generals. Staff and petty officers and employees. **N. Y. 360, 21 Ap**
- 1118 Amending law as to officers and rank. **Mass. 182, 25 Mr**
R. I. 320, 28 Ap
- 1119 Government and support of U. S. vessel loaned for use. **Mass. 289, 15 Ap**
- 1120 **Hospital corps.** Establishment authorized. Organization. **N. Y. 853, 22 My**
- 1121 Increasing number of hospital stewards and of corps. **O. p. 385, 27 Ap**
- 1122 **Signal corps.** Additional officers established. **N. Y. 668, 14 My**
- 1123 Pay of injured. Members injured in actual service allowed duty pay and expenses during incapacity. **N. Y. 853, 22 My**
- 1124 **Armories.** To be furnished and maintained at *state* [formerly at county] expense. **O. p. 213, 21 Ap**
- 1125 **Military property.** Penalty for injuring. **N. Y. 552, 12 My**
- 1126 **Service medals.** Application of act extended. **Mass. 348, 1 My**
- 1127 **Transportation.** Prohibition of special rates not to apply to transportation of militia. **La. 34, 14 Ap**

Veterans. War memorials

(See also Exemption from taxation, 408; Art memorials, 165)

- 1128 **State pensions.** Increasing rates. Certain widows may receive. County examiners. **S. C. 75, 9 Mr**
- 1129 Constitutional amendment allowing pensions to indigent Confederate veterans and their widows. *Rejected by people, 1896.* **La. 192, 196, '94**
- 1130 Special allowance for loss of eyes, hands or feet. **Miss. 53, 23 Mr**
- 1131 Widows whose husbands, having received pension for injuries died from such injuries, to receive \$60 per year. **Ga. p. 102, 16 D '95**

- 1132 Confederate veterans who received certain wounds, or their widows, may claim free 160 acres of state land. La. 55, 9 J1
- 1133 State board of relief need not apportion its work in districts. B. I. 315, 17 Ap
- 1134 Local relief. Regulating care of indigent veterans. Burial at public expense. N. Y. 225, 8 Ap
- 1135 G. A. R. joint relief committees in cities having two or more posts. N. Y. 598, 13 My
- 1136 Burial. By state; act amended and extended to wives and widows in certain cases. Mass. 279, 14 Ap
- 1137 Penalty for removing G. A. R. grave-marker or other distinguishing marks. O. p. 199, 18 Ap
- 1138 Soldiers' home. Amending law as to admission. Veterans not enrolled from state may be received after five years residence in state, etc. La. 102, 9 J1
- 1139 Liquor not to be sold near. O. p. 369, 27 Ap
- 1140 Allowing sale of ale and beer. Use of proceeds for library, etc. N. Y. 900, 26 My
- 1141 Preference of veterans. (*See also* Insurance, 1255) To receive peddler's license free. Md. 300, 2 Ap
- 1142 Right to free peddler's license extended to Mexican and Indian war veterans. Veterans must be residents of state. Ga. p. 19, 14 D
- 1143 Preferred in local civil service. O. p. 50, 3 Mr
- 1144 Remedy for refusal to prefer in civil service. N. Y. 821, 21 My
- 1145 Extending act giving preference in civil service. Mass. 517, 9 Je
- 1146 Memorial day. Prohibiting public games near place of celebrating. O. p. 120, 6 Ap
- 1147 Soldiers' monuments. Towns may vote money to dedicate. Mass. 291, 15 Ap
- 1148 Amending act providing for construction by counties. N. J. 54, 18 Mr
- 1149 Counties may borrow for erecting or acquiring buildings in memory of soldiers. O. p. 342, 27 Ap
- 1150 Exempt from taxation. Md. 300, 2 Ap
- 1151 Sailors' monument; appropriation in aid. Md. 343, 4 Ap
- 1152 Chickamauga and Chattanooga park. Appropriation for monuments. Ga. p. 11, 16 D '95
Ky. 24, 17 Mr
- 1153 Conveyance of lands owned by state to U. S. N. Y. 189, 1 Ap
Ga. p. 77, 3 D '95

- 1154 **Stony point battlefield.** Purchase by state authorized.
N. Y. 214, 7 Ap
- 1155 **Battle flags.** Purchase of nets for protection. O. p. 140, 10 Ap
- 1156 **Records.** Of state troops to be compiled and published. Commission created.
Md. 143, 2 Ap

Charities

(See also Membership corporations, 313; Fraternal societies, 1257; State institutions, 890)

- 1157 **Charities and correction.** General law. State board of charities and charities aid association. Institutions, public and private. Reformatories. Feeble-minded and epileptics. N. Y. 543, 26 Mr
- 1158 **Act establishing council of charities and correction (1883)** amended.
N. J. 124, 26 Mr
- 1159 **County commissioners must visit all institutions, public or private, semi-annually, and report their condition.** O. p. 212, 21 Ap
- 1160 **Commission to consider reform in laws.** Mass. Res. 60, 13 Ap
- 1161 **Powers of state board of charities as to poor relief.**
N. Y. 225, 8 Ap
- 1162 **State benevolent institutions.** Amending procedure for acquiring real estate.
O. p. 343, 27 Ap

Insane

(See also Guardianship, 593; Property, 499, 599; Insane criminals, 1311)

- 1163 **General.** Codification of laws. State commission and institutions. Commitment, care, support, etc. Insane criminals.
N. Y. 545, 12 My
- 1164 **General law.** Asylums; government, admission, examination. Guardians of insane.
Utah 127, 5 Ap
- 1165 **Asylums.** Appropriation for additional. Ia. 139, 140, 17 Ap
- 1166 **Name changed from lunatic asylum to hospital for insane.**
S. C. 70, 11 F
- 1167 **Appropriations for support to be paid quarterly in advance.**
Ia. 56, 8 Ap
Ky. 13, 17 Mr
- 1168 **Claims for value of county insane asylums at time of transfer to state.**
N. Y. 481, 9 My
- 1169 **Repealing certain provisions as to care outside asylums.**
O. p. 170, 16 Ap
- 1170 **Transfer to other asylums, etc.; act amended.** Mass. 482, 4 Je
- 1171 **Examinations.** Commitments. May be before common pleas court or *judge of criminal court in city over 100,000 only* [formerly before any police justice.]
N. J. 101, 26 Mr

- 1172 Fees of probate judge and officers.** Dangerous lunatics may be temporarily taken into hospital awaiting order of commitment. S. C. 71, 9 Mr
- 1173 County commissioners of insanity.** Two boards in counties where there are two district courts. Ia. 53, 10 Ap
- 1174 Support.** Estates of insane in county asylums and hospitals liable for support. Ia. 52, 4 Ap
- 1175 Recovery.** On petition of person alleging his recovery, he is entitled to jury trial, and verdict is binding. Md. 33, 11 Mr

Deaf and dumb. Blind

- 1176 Both classes.** Reorganizing deaf and dumb and blind school. Government. Separate schools for deaf and blind. No tuition. Va. 702, 4 Mr
- 1177 Limit of 10 years of instruction for deaf, blind or imbecile children** may be extended by special recommendation. B. I. 324, 6 My
- 1178 State deaf and dumb school.** Organization and government. Utah 25, 21 F
- 1179 Compulsory attendance of deaf children 7 to 17.** Certificate on graduation. B. I. 332, 13 My
- 1180 Extending time pupils may remain.** O. p. 69, 13 Mr
- 1181 State comptroller to act as treasurer.** N. J. 95, 25 Mr
- 1182 Private homes.** Counties may contract with, to maintain aged and infirm deaf. O. p. 419, 27 Ap
- 1183 School for the blind.** Organization and government. Utah 48, 13 Mr
- 1184 Act for establishing workshops repealed.** O. p. 370, 27 Ap

Other charities

- 1185 Charity hospitals.** May take land by condemnation. La. 96, 9 Jl
- 1186 Poor relief.** General law. N. Y. 225, 8 Ap
- 1187 Penalties for neglect of duty by poor officers or unlawful removal of paupers.** N. Y. 550, 12 My
- 1188 Townships formed out of old townships to have share in management of poor-house of latter.** N. J. 84, 24 Mr
- 1189 Homes for the aged.** Religious corporations may establish. N. Y. 525, 11 My
- 1190 Regulating admission and care of aged, decrepit and feeble-minded persons in institutions other than insane hospitals.** N. Y. 914, 27 My

Children. Orphans (*See also* Family, 9; Guardians, 598)

- 1191 District children's home; authorizing acceptance of bequests.
O. p. 382, 27 Ap
- 1192 Court may compel institutions or officers having bound out children to disclose whereabouts to relatives and to allow visits.
Mass. 288, 15 Ap
- 1193 State to pay 50 cents a week for instruction of children under state care in town or city schools in certain cases.
Mass. 382, 9 My
- 1194 General law for adoption of children. Apprenticeship.
N. Y. 272, 17 Ap
- 1195 When child in orphan asylum, proceedings for adoption may be in county where located.
S. C. 86, 5 Mr
- 1196 Ambulance service. Misdemeanor to refuse to answer call for aid to sick or injured.
N. Y. 873, 22 My
- 1197 Pawnbroking companies. Act of 1895 extended to counties containing city over 25,000.
N. Y. 206, 4 Ap

Penal and reformatory institutions

(*See also* Criminal procedure, 809-814; State institutions, 890)

State prisons and convicts

(Including provisions applying also to local prisons)

- 1198 General. Government. Officers. Employes and compensation of state prison commission.
N. Y. 430, 4 My
- 1199 General law. Bi-partisan board. Government, discipline. Classification, register and parole of prisoners. Restoration to citizenship. Labor, state account system.
Utah 81, 3 Ap
- 1200 Board of commissioners to govern. To appoint warden.
Utah 2, 24 Ja
- 1201 State warden of penitentiary established. To visit and report on penitentiary and convict camps.
Ia. 127, 9 Jl
- 1202 Increasing salary and bond of clerk.
Ia. 79, 17 Ap
- 1203 Lighting; board of inspectors and supervisor to make contracts on terms in their discretion.
N. J. 164, 14 Ap
- 1204 Convict labor. (*See also* County jails, 1228) General law for state and local prisons. Products to be sold only to state or its subdivisions, which so far as possible shall not buy other goods. Contracts prohibited.
N. Y. 429, 4 My

- 1205 Proposed constitutional amendment, prohibiting leasing of convicts and authorizing employment on public roads, levees, etc., and on convict farms or manufactories owned by state. *Rejected by people*, 1896. La. 104, '94
- 1206 Providing for interchange by prisons and other state institutions of their respective products. Commission created. O. p. 183, 17 Ap
- 1207 Lessees must pay for labor monthly in legal money. S. C. 85, 9 Mr
- 1208 Where lease is vacated new lease shall be only for unexpired term. Ga. p. 80, 14 D '95
- 1209 Convict-made goods must be plainly marked as such. Penalty. N. Y. 931, 27 My
- 1210 Chain gangs; amendments. Municipal prisoners. S. C. 113, 9 Mr
- 1211 Insane convicts. General regulation of state hospital for. N. Y. 545, 12 My
- 1212 To be transferred to asylum. La. 105, 9 Jl
- 1213 Parole. Pardons. Submitting constitutional amendment limiting governor's pardoning power and creating board — governor, attorney-general and chief justice. *Adopted by people*, 1896. Minn. 2, 26 Ap '95
- 1214 Submitting constitutional amendment that board shall consist of governor, *secretary of state, comptroller, commissioner of agriculture and attorney-general* [formerly justices of supreme court]. *Adopted (?) by people*, 1896. Fla. J. Res. 3, 29 My '95
- 1215 Special legislative committee to examine cases of convicts now imprisoned and make recommendations to governor. Ga. p. 435, 17 D '95
- 1216 Record of pardon to be filed with clerk of court of county where convicted. S. C. 57, 28 F
- 1217 Person convicted for third state prison offense to be sentenced for 25 years besides regular term, subject to parole by governor if reformed. B. I. 336, 14 My
- 1218 Management of convicts — miscellaneous. Convicts to be taken to penitentiary by an officer of *penitentiary* [formerly of court]. Va. 204, 30 Ja
- 1219 Superintendent of penitentiary to keep account of expenses for transporting convicts. Va. 782, 4 Mr
- 1220 Removal and quarantine in case of contagious diseases in penitentiary or jails. Va. 162, 27 Ja

- 1221 Communication with prisoners, in whose presence allowed.
Va. 551, 28 F
- 1222 Punishment; requiring record of cause and nature. Inspection of
record.
Va. 322, 11 F
- 1223 Maltreatment of state or county prisoners; definition and penalty.
Miss. 88, 19 Mr
- 1224 Imprisonment of women to be in *state prison for women* if over one
year; otherwise in county jail or reformatory or house of
refuge.
N. Y. 374, 22 Ap
- 1225 Injury to property by convicts; penalty.
Mass. 344, 28 Ap
- 1226 Prisoners under 18 in state or local prisons to be kept separate.
Ia. 105, 8 Ap

County jails and prisoners

(See also Sheriffs, 647)

- 1227 Sheriffs, etc., to report to court at each term number of prisoners
in county and city jails.
Va. 125, 23 Ja
- 1228 Imperative duty of supervisors to hire out or work convicts. Mis-
cellaneous provisions.
Miss. 133, 23 Mr
- 1229 Employment of labor on penal institutions or highways.
N. Y. 826, 21 My
- 1230 Increasing allowance for food and care. Additional comforts for
prisoners for debt.
O. p. 288, 22 Ap
- 1231 Charge for feeding prisoners fixed.
S. C. 108, 9 Mr

Reformatories

(See also Juvenile offenders, 812; 1224, 1225)

- 1232 General regulation of institutions for juvenile and female delin-
quents.
N. Y. 546, 12 My
- 1233 Appropriation for buildings for Eastern New York reformatory.
N. Y. 381, 23 Ap
- 1234 Board of managers paid \$500 each yearly.
O. p. 311, 24 Ap
- 1235 Procedure for contracts for improvements or buildings.
O. p. 217, 21 Ap
- 1236 Suffolk county reformatory established. Government.
Mass. 536, 9 Je
- 1237 Industrial school. Change of name and location. Trustees.
Buildings. Parole.
Utah 123, 5 Ap
- 1238 \$10 a month for support of each inmate.
Ia. 41, 7 Ap
- 1239 Houses of reform. Establishing one for boys and one for girls.
Government; commitments.
Ky. 83, 21 Mr

- 1240 Houses of refuge for women. Children of inmates may be bound out. N. Y. 587, 12 My
- 1241 Reformatory for women. Transfer of certain prisoners authorized. Mass. 317, 27 Ap

Insurance

General—all classes

(See also Taxation, 423; Service of process, 674)

- 1242 Incorporation. Government. Repealing law allowing courts to grant charters under general corporation law. Va. 74, 17 Ja
- 1243 Certificate of secretary of state renewed annually. Filing of statements. Utah 107, 108, 5 Ap
- 1244 In domestic companies *a majority only* [formerly all] of directors must live in state. Mass. 253, 7 Ap
- 1245 Investments. Increasing list of securities that may be held. N. J. 87, 24 Mr
- 1246 May be in same securities as savings banks. Mass. 171, 19 Mr
- 1247 Policies. Issued by companies that have not complied with state law are void. Ia. 23, 14 Ap
- 1248 Insurance agents. Amending as to license. Md. 266, 7 Ap
- 1249 Non-residents may be licensed if their states license agents in this state. Mass. 448, 28 My
- 1250 Agents of foreign companies who are accountable to other agents in this state need not give bond. Mass. 402, 15 My
- 1251 Foreign companies. All insurance companies of any foreign country which shall refuse to allow a New York company, duly qualified, to do business, are excluded from this state. N. Y. 23, 17 F

Life and accident insurance

(See also Married women, 504; Insolvency, 558)

- 1252 Assessment life insurance; regulations amended. Calls and failure to pay. Special examinations; receivers. Reinsurance. Medical examination required, etc. Mass. 515, 6 Je
- 1253 Surrender value of endowment policies; repealing provision that five per cent may be deducted by company. Mass. 470, 4 Je
- 1254 Foreign life companies; procedure for transfer of security deposits to receivers of bankrupt companies. N. Y. 322, 18 Ap
- 1255 Confederate veterans may act as traveling agents without license. Ga. p. 92, 16 D '95

- 1256 Payments of accident or sick benefit insurance exempt from execution. Va. 643, 3 Mr
- 1257 Fraternal beneficiary societies. General law for incorporation and regulation. Annual reports. O. p. 360, 27 Ap
Ia. 21, 3 Ap
N. Y. 377, 23 Ap
- 1258 General law. Not applicable to Masons, etc., whose chief object is not insurance or profit. S. C. 46, 25 F
- 1259 If paying only funeral expenses and sick benefits, exempt from general law. Mass. 136, 5 Mr
- 1260 Representation at state councils or lodges. Md. 331, 7 Ap
- 1261 Foreign mutual benefit associations to designate person on whom process may be served in each county where doing business. Miss. 57, 9 Mr

Fire and casualty insurance

- 1262 Amending law as to "guaranty surplus" and "special reserve" funds. Lowering rate of allowable dividends during their accumulation. B. I. 307, 31 Ja
- 1263 Prohibiting combinations to fix rates. Ia. 22, 3 Ap
- 1264 Policies. Requirement of certain amount of insurance or making holder a coinsurer prohibited. O. p. 107, 30 Mr
- 1265 Full amount of loss must be paid, in spite of any stipulation. Ga. p. 51, 23 N '95
S. C. 49, 28 F
- 1266 Additional tax on companies making higher charge on account of "valued policy" law. Miss. 56, 20 Mr
- 1267 Loss paid on stock of goods to be only actual value when destroyed. Companies to furnish blank proof of loss. Miss. 56, 20 Mr
- 1268 Reducing penalty for including fees in cost of insurance. N. Y. 841, 22 My
- 1269 Single risk not to exceed 10 per cent of capital or assets; in case of mutual company not over 5 per cent of cash assets. Va. 421, 26 F
- 1270 Mutual companies. Change to stock companies; procedure amended. N. Y. 850, 22 My
- 1271 Extension of territorial limits of town and county cooperative insurance companies. N. Y. 907, 27 My
- 1272 If guaranty capital less than \$100,000, subject to same limitations as those without guaranty. Mass. 123, 3 Mr

- 1273 **Mutual protection associations for insurance of members only, by assessment; incorporation.** S. C. 47, 9 Mr
- 1274 **Lloyds fire associations; amending incorporation law. Penalty for doing business when not conforming to law.** N. J. 105, 26 Mr
- 1275 **Foreign; alternative conditions as to assets required for admission to business.** Mass. 270, 13 Ap
- 1276 **Casualty insurance. Increasing list of casualties which cooperative companies may insure against.** N. Y. 844, 22 My
- 1277 **Fire insurance companies may insure against injury to or by apparatus used for fire protection.** Mass. 140, 11 Mr
- 1278 **Live stock insurance. General insurance law applied to mutual companies.** Ga. p. 53, 14 D '95
- 1279 **Burglary insurance. Foreign companies may be admitted to business.** Mass. 124, 3 Mr

Surety and guaranty companies

(See also for acceptance, etc., on special classes of bonds, 35, 298, 310, 335, 551, 911; also 337, 426)

- 1280 **Surety companies. May be accepted on all bonds if duly approved.** S. C. 20, 25 F
- 1281 **May execute bonds of public officers.** O. p. 320, 27 Ap
- 1282 **Act amended as to right to sign bonds.** Miss. 55, 6 Mr
- 1283 **Amending as to deposit with state and liability of companies. Suits.** Va. 406, 21 F
- 1284 **Amending law. Must [formerly may] be accepted on all bonds. Rights and obligations.** Va. 248, 6 F
- 1285 **Title guaranty companies. Must deposit with state securities equal to one half capital, at least \$250,000.** O. p. 321, 27 Ap
- 1286 **Additional powers of companies in counties of 100,000 to 250,000.** N. Y. 38, 25 F
- 1287 **Credit insurance. Companies may be formed under insurance law.** Mass. 447, 28 My

Transportation. Communication

(See also Taxation, 427; Liens, 532; Condemnation, 763)

Railways

- 1288 **Railroad commissioners. Submitting constitutional amendment allowing creation of office; three members; term three years. Rejected by people, 1896.** Neb. 107, 30 Mr '95

Organization. Property. Powers

- 1289 **Foreign companies.** To file copy of charter with secretary of state and in each county where property lies. S. C. 50, 9 Mr
- 1290 **Consolidation.** Issue of bonds by consolidated companies; act amended. O. p. 415, 27 Ap
- 1291 **Authorizing acquisition of additional real estate for shops, etc., in case of.** Va. 277, 11 F
- 1292 **Sale of railways.** Purchasers to retain no special exemptions from taxation or immunities not enjoyed by all railways. Ga. p. 62, 16 D '95
- 1293 **Mortgages.** Certain restrictions not to apply when mortgage is for purchase money of equipment or property. S. C. 55, 9 Mr
- 1294 **Foreclosure and powers of purchasers at sale; act amended.** N. Y. 358, 21 Ap
- 1295 **Voluntary dissolution.** On petition of 90 per cent of stock, when operation abandoned five years. N. J. 9, 3 Mr
- 1296 **Insolvent railways.** Reorganization; general procedure for railways and bridge companies over navigable rivers. Ky. 21, 17 Mr
- 1297 **Location of tracks.** Exception to prohibition on building within 10 miles of another railway, in certain cases, subject to approval of railroad commission. Ga. p. 60, 14 D '95
- 1298 **Cities may contract with railways to allow construction in streets.** N. J. 152, 9 Ap
- 1299 **Subject to railroad commission, manufacturing plants may build side and spur tracks to connect with railway.** Miss. 60, 19 Mr
- 1300 **Electric power.** Railways or street railways may change to electric power. May contract for joint transportation of passengers or freight. E. I. 400, 28 My
- 1301 **Employees.** (*See also* Employers' Liability, 280) Employment of persons addicted to intoxication prohibited. N. Y. 112, § 41, 23 Mr
- 1302 **Receivers, etc., of railways have same liability to employees as corporations.** Ga. p. 103, 16 D '95

Regulation of traffic

- 1303 **Freight rates. Cooperation.** Railway may not refuse to receive freight from another road and to pay accrued charges. Exceptions. No discrimination. S. C. 53, 9 Mr
- 1304 **Connecting railways operated by one management to be treated as one road in fixing rates.** S. C. 54, 9 Mr
- 1305 **Equal facilities and rates to be given by railway to every connecting road. Shipper may designate route.** S. C. 56, 9 Mr

- 1306 Shipping livestock.** Shippers may at their own expense put in bars, gates or upper deck, and cars so loaded must be transported. Miss. 62, 18 Mr
- 1307 Unclaimed freight and baggage.** Carrier after 60 days may deliver to storage warehouse, which after 90 days more may sell. Surplus goes to state. Utah 70, 28 Mr
- 1308 To be delivered to storage warehouse after 60 days. Sale.** Perishable goods and livestock. N.Y. 974, 28 My
- 1309 Sale of livestock or perishable goods after 24 hours, on application to court.** Md. 296, 2 Ap
- 1310 Passenger traffic.** Rates; first class fixed at 3 1-4 cents a mile, second class, 2 3-4. May be changed as to any road by railroad commissioners. S. C. 52, 9 Mr
- 1311 Passenger trains must run at least once a day each way, except Sunday.** Ky. 9, 17 Mr
- 1312 Railroad commissioners to examine schedules and where feasible compel close connections of intersecting lines.** S. C. 51, 9 Mr
- 1313 Mileage books; act requiring issue amended.** Good for family or salesmen. N. Y. 835, 22 My
- 1314 Penalty for forging or altering tickets, checks, etc.** La. 67, 9 Jl
- 1315 Stations.** Railroad commissioners must require railways to conform name of station to that of town, when petitioned. Ia. 35, 2 My
- 1316 Union depot companies.** May issue bonds; regulations. O. p. 118, 3 Ap
- 1317 Bicycles.** Must be checked and carried as other baggage. N. Y. 333, 20 Ap
O. p. 372, 27 Ap
B. I. 345, 14 My
- 1318 Railroad and steamboat police.** Evidence of appointment and of being on duty. Mass. 225, 28 Mr

Protection and safety (*See also Crimes and punishments, 830, 834, 843, 847*)

- 1319 Interlocking crossings.** Trains need not stop at crossings having duly approved interlocking signals or similar device. Miss. 61, 23 Mr
O. p. 315, 27 Ap
- 1320 Crossings hereafter built must have such system.** O. p. 315, 27 Ap
- 1321 Grade crossings.** Cities over 100,000 may abolish, at joint cost of city and railway. Procedure. N. J. 97, 25 Mr
- 1322 Automatic couplers.** Not required on engines. N. Y. 664, 14 My

- 1323 "Coal jimmies." Use on certain roads restricted.
N. Y. 485, 486, 9 My
- 1324 Heating cars. Cars used by fish commissioners exempt from prohibition of stoves.
N. Y. 290, 17 Ap
- 1325 Fire extinguishers. One car on each train to be at once equipped with portable chemical extinguishers and one car thereafter equipped yearly.
O. p. 396, 27 Ap
- 1326 Speed. Railways running trains in city or town over six miles per hour liable for damages caused, but not to fine.
Miss. 63, 13 Mr
- 1327 Accidents. Testimony and reports concerning; act amended.
Mass. 302, 22 Ap

Street railways. Rapid transit

- 1328 Franchises. Construction. (*See also* Municipalities, 942) Construction only after grant by local authority, made after duly advertised hearing, and consent of one half abutting property. Change of power.
N. J. 192, 21 Ap
- 1329 Cities and towns under 20,000 may allow railway and other corporations to use streets on popular vote.
La. 79, 9 Jl
- 1330 Existing companies may extend lines subject to restrictions of new companies.
N. J. 211, 12 My
- 1331 Municipal councils may renew expired franchises.
O. p. 206, 21 Ap
- 1332 Railroad commissioners may authorize extension into adjoining cities or towns.
Mass. 501, 5 Je
- 1333 Capital. Increase, and requirements in case of impairment; act amended.
Mass. 409, 16 My
- 1334 Consolidation. Purchase or consolidation of lines authorized under terms as to fares, transfers, etc., fixed by municipal authorities. Such terms subject to re-determination every 15 years.
O. p. 277, 22 Ap
- 1335 Regulations. Street railways on state highways; change of grade or material between tracks.
Mass. 541, 9 Je
- 1336 Unlawful to carry freight or express matter.
N. J. 144, 30 Mr
- 1337 May change to electric power. May contract with railways for transporting passengers or freight.
B. I. 400, 28 My
- 1338 Railroad commissioners may appoint an expert electrical inspector.
N. Y. 456, 9 My
- 1339 Elevated railways. Electric lights in cars in New York city.
N. Y. 388, 27 Ap

- 1340 **Rapid transit.** Act for underground system in cities over 1,000,000 amended. Lease. N. Y. 729, 19 My
- 1341 **Transportation by pneumatic pressure.** Opening of streets for, subject to law as to gas companies, etc. Mass. 544, 9 Je

Other forms of transportation

- 1342 **Express companies.** Declared common carriers and subject to railroad commission. Ia. 33, 14 Ap
- 1343 **Telegraph companies.** If error or delay occurs in transmitting message, burden of proof that it is not due to negligence rests on company. Action must be begun in 60 days. Ia. 108, 30 Ap
- 1344 **Telephone charges.** Allowing increased maximum charges for long distance lines according to distance. Md. 139, 2 Ap
- 1345 **Navigation.** (*See also* Liens, 534; Quarantine, 1364) Minimum capital for companies reduced. May operate on canals. N. Y. 935, 27 My
- 1346 **Definition of navigable waters:** streams over 25 miles long able to float, for 30 consecutive days yearly, steamer with 200 bales of cotton. Miss. 64, 23 Mr
- 1347 **Penalty for injuring fastenings or equipment of vessels.** N. Y. 552, 12 My
- 1348 **Pilotage.** Coasting vessels or those loaded with coal or coke mined in U. S. exempt from compulsory taking of pilot. Md. 40, 11 Mr
- 1349 **Amending law as to fees for pilotage and requirements for license.** Miss. 123, 20 Mr
- 1350 **House-boats.** Requiring license and registry of boats used as residence or place of business. O. p. 208, 21 Ap
- 1351 **Canals.** Tax for extraordinary improvements and for electrical communication between stations, etc. N. Y. 947, 28 My
- 1352 **Form of contracts for improvements; plans, alteration, etc.** N. Y. 794, 20 My
- 1353 **Discretion allowed as to removing certain encroachments.** N. Y. 492, 11 My
- 1354 **Floating elevators; use authorized and regulated.** N. Y. 881, 25 My
- 1355 **Company chartered for ship canal across Cape Cod peninsula.** Mass. 542, 9 Je
- 1356 **General incorporation law for ship canal companies.** Powers. O. p. 410, 27 Ap
- 1357 **Ferries.** Unlawful to transport persons over Mississippi for hire within two miles of licensed ferry. La. 63, 9 Jl

Public health and safety

General supervision

(See also Sweat shops, 287; Pollution of water 1008; Sewers, 1033; Cemeteries, 1856; Domestic animals, 1474)

- 1358 State board of health. Members not to belong to faculty of medical school. Ia. 91, 4 Ap
- 1359 Executive committee may have all powers. Miss. 68, 19 Mr
- 1360 Allowed *per diem* pay and traveling expenses. Va. 612, 3 Mr
- 1361 Local boards of health. Vacancies how filled. S. C. 69, 25 F
- 1362 Added regulations as to authenticating and publishing health ordinances of city boards of health. Ia. 11, 14 Ap
- 1363 Contagious diseases. Amending law. Powers of state and local health boards; quarantine. Va. 612, 3 Mr
- 1364 Regulating fumigation of vessels; fees. N. Y. 435, 9 My
- 1365 Requiring vaccination of all persons within five miles when small-pox epidemic likely to occur. Virus how furnished. Miss. 69, 19 Mr
- 1366 Nuisances. Municipalities may define and abate. O. p. 346, 27 Ap
- 1367 Compelling owner of any dead animal or of decaying animal or vegetable matter to bury it within three hours after notice. Ga. p. 86, 16 D '95
- 1368 Requiring license of stables in cities over \$5,000 [formerly 50,000]. Mass. 332, 28 Ap
- 1369 Plumbing. Requiring plumbers to be examined and licensed. Boards established in places over 5,000. O. p. 263, 21 Ap
- 1370 Blindness. Physicians, midwives, etc., to report redness or inflammation of eyes at birth. Ia. 57, 3 Ap
S. C. 107, 25 F

Practice of medicine, etc.

- 1371 Practice of medicine. Definition. Miss. 68, 19 Mr
- 1372 General law. State board to approve diplomas or examine. O. p. 44, 27 F
- 1373 Four years [formerly three] course; other qualifications increased. N. Y. 111, 21 Mr
- 1374 Amending as to registering physicians already in practice or coming from other states, and as to violations of law. Md. 194, 4 Ap

- 1375 Complaint for violation of law may be brought by secretary of state board of health; no undertaking required.
B. I. 340, 13 My
- 1376 State boards may sue for injunction to prevent illegal practice; may employ counsel.
La. 13, 2 Jl
- 1377 Dentistry. Required qualifications increased. Change of county of residence. Conviction of felony to forfeit license.
N. Y. 297, 17 Ap
- 1378 Reorganizing state board. Requiring *both* [formerly either] graduation and examination — though latter may be waived by board.
Md. 378, 4 Ap
- 1379 Pharmacy. Consolidation of laws. Special duty of state board in investigating illegal sale of liquor.
Mass. 397, 15 My
- 1380 Licensed physicians may practice pharmacy.
Miss. 70, 19 Mr
- 1381 Office of secretary and treasurer of commissioners of pharmacy established.
Ia. 59, 14 Ap

Foods. Adulteration

(See also Labor—Bakeries, 284, 1415; Animals, 1474, 1496; Dairy, 1499)

- 1382 Miscellaneous regulations as to packing and sale.
N. Y. 376, 22 Ap
- 1383 Canned fruit and vegetables. Grade and name of packer to be stamped on cans. "Soaked" goods to be so marked.
Ky. 32, 21 Mr
- 1384 Linseed oil. Prohibiting adulteration. Standards; branding.
O. p. 417, 27 F
- 1385 Vinegar. Regulating manufacture and prohibiting adulteration.
O. p. 100, 30 Mr
- 1386 Candy. Adulteration prohibited.
S. C. 95, 9 Mr
Utah 68, 28 Mr
B. I. 350, 15 My
- 1387 Liquors. More rigid definitions and prohibitions. Must meet standard of drugs.
Mass. 272, 13 Ap
- 1388 Prohibiting fraudulent use of names or brands by distillers. Warehouse receipts must be signed by actual owner or operator of distillery.
Ky. 35, 27 Mr

Public safety

- 1389 Fireworks. Not to be exploded within 300 yards of railway depot or cotton or hay warehouse.
Miss. 169, 23 Mr
- 1390 Fire crackers to contain no other explosive than gunpowder.
B. I. 342, 14 My

- 1391 Illuminating oils. Regulating tests and storage.
N. Y. 376, 22 Ap
- 1392 Inspection act extended to naphtha, benzine and gasoline.
Ia. 94, 14 Ap
- 1393 Turpentine and petroleum products may be stored in dwelling houses.
Mass. 520, 9 Je
- 1394 Engineers. Licensing; act amended. Exceptions to law. State inspectors.
Mass. 546, 9 Je
- 1395 Buildings. Provisions to secure safety during construction.
N. Y. 936, 27 My
- 1396 Cities and villages may regulate and inspect buildings, elevators, etc.
O. p. 408, 27 Ap
- 1397 Provisions for proper exits and fire extinguishers extended to all buildings of public assembly, hospitals, etc. Duty of factory inspector.
O. p. 408, 27 Ap
- 1398 Investigation of fires. What officers shall make.
Mass. 803, 22 Ap
- 1399 Fire marshals given powers of coroners. To report at once. Penalty for neglect.
Va. 508, 27 F
- 1400 Forest fires. Wardens in each town of certain counties. Duties, pay.
N. Y. 655, 14 My

Trade. Industries. Mining

Domestic trade and commerce

(See also Corporations, 390; Licenses, 422; Negotiable instruments, 537; Partnerships, 554)

- 1401 General law. Weights and measures. Regulation of spirits, oils, milk cans, canned food, oysters, fertilizers. Elevators; hotels. Auctioneers and peddlers. Packing and marking flour, hay, hops, meat, etc.
N. Y. 376, 22 Ap
- 1402 Penalties for violation of certain provisions.
N. Y. 551, 12 My
- 1403 Warehouses. General law. Bonds; receipts; sale of goods.
S. C. 90, 9 Mr
- 1404 Only licensed warehouse may issue receipts. Signs, advertisements, etc., to state fact of license. Duplicate receipts to state reason for issue.
Va. 499, 27 F
- 1405 Unclaimed goods; report to justice of peace to be in *three* [formerly six] months. Notice to owner if known.
Ia. 107, 8 Ap
- 1406 Penalty for selling or hypothecating receipts to another than owner without accounting to him.
Va. 614, 3 Mr

- 1407 Commission merchants.** Consignor or owner of farm products has lien on estate of insolvent or dead merchant.
Va. 613, 3 Mr
- 1408 Penalty for fraudulently securing consignments of farm produce.**
Ga. p. 65, 16 D '95
- 1409 Weights and measures.** Office of state sealer abolished.
Utah 98, 5 Ap
- 1410 Sealers not compelled to visit owners of scales, etc., who have failed to report.**
Va. 306, 12 F
- 1411 Compensation of sealers, when to be fees and when salary.**
B. I. 354, 15 My
- 1412 Size of apple and similar barrels.** To be stamped as standard.
O. p. 406, 27 Ap
- 1413 County commissioners to appoint cotton weighers when petitioned. Duties.**
S. C. 27, 9 Mr
- 1414 Municipalities over 10,000 may require all coal to be weighed on public scales.**
S. C. 44, 9 Mr
- 1415 Sale of bread to be by weight. Must be pure.** N. J. 178, 16 Ap
- 1416 Bottles, barrels, etc. Protection of owners.** N. Y. 933, 27 My
- 1417 Protecting owners of bottles used for seltzer or mineral waters.**
La. 120, 9 JI
- 1418 Legal holidays.** (*See also* Maturity of commercial paper, 538) Arbor day, second Friday in May.
B. I. 334, 13 My
- 1419 Labor day and Arbor day (15 April).** Utah 14, 15 F
- 1420 Decoration day, May 10.** S. C. 80, 7 F
- 1421 Decoration day, April 6.** La. 110, 9 JI
- 1422 Auctioneers.** Amending law as to allowable charges. On chattels not over five per cent.
La. 104, 9 JI
- 1423 Public accountants. Qualifications. Examination to be held; state board established.** N. Y. 312, 17 Ap
- 1424 Standard time.** Clocks run at public expense must keep.
O. p. 312, 24 Ap
- 1425 Pawnbrokers. License and regulation. Limit of interest. Bond.** Va. 741, 4 Mr
- 1426 Act authorizing pawnbroking companies for relief of poor borrowers extended to cities over 25,000.** N. Y. 206, 4 Ap
- 1427 Newspapers.** In legal proceedings reporters not compelled to disclose source of information.
Md. 249, 2 Ap

Arts and industries

- 1428 **Omaha exposition.** Commission for state exhibit.
Ia. 149, 17 Ap
La. 49, 7 Jl
- 1429 **Manufacturing.** Extending time and scope of act exempting new factories from taxation for 10 years. Miss. 54, 23 Mr
- 1430 **Submitting constitutional amendment** that general assembly may authorize municipal corporations to levy special taxes for aiding companies. *Rejected by people, 1896.* La. 202, '94
- 1431 **Canalgre.** Bounty of \$1 ton, and on leather tanned from canalgre raised in state. Utah 112, 5 Ap
- 1432 **Silk culture.** Bounty of 25 cents a pound for silk cocoons. Distribution of pamphlets, etc. Utah 92, 4 Ap
- 1433 **Silverware.** Prohibiting marking as "coin" or "sterling" when not standard.
O. p. 54, 5 Mr
N. J. 35, 11 Mr
B. I. 329, 12 My
Va. 315, 13 F
- 1434 **Mills and dams.** Extending purposes for which land may be condemned, and amending procedure. Miss. 127, 6 Mr
- 1435 **Horseshoeing.** Regulating practice in cities over 50,000. Examination. N. Y. 271, 17 Ap

Mines and mining

- 1436 **Eminent domain.** (*See also* 510) Additional rights, for transportation of ores, etc. Ga. p. 20, 16 D '95
- 1437 **Miners — employment.** Corporations to pay wages bi-weekly. Md. 133, 4 Ap
- 1438 **Eight hours a day's labor** in all mines and smelters. Utah 72, 30 Mr
- 1439 **No person under 14 and no woman** to be employed in mine or smelter. Utah 28, 2 Mr
- 1440 **Coal mines.** Inspector established. Powers. Regulating working of mines. Utah 113, 5 Ap
- 1441 **Only pure animal or vegetable oil or paraffin** to be used for illumination. Standard. Ia. 92, 19 Mr; 93, 8 Ap
- 1442 **Natural gas.** Repealing requirement that "jumbo" burners be enclosed in globes. O. p. 78, 19 Mr

Agriculture

General encouragement. Associations

(See also Peddling farm produce, 442; Liens on crops, 517, 533; Bounties, 1432)

- 1443 **Agricultural societies.** Apportionment of moneys appropriated by state for premiums. N. Y. 221, 8 Ap
- 1444 **Powers of associations for holding fairs.** Police officers and regulations. N. J. 129, 30 Mr
- 1445 **Certain restrictions on awarding premiums repealed.** N. Y. 476, 9 My
- 1446 **Farmers institutes.** Office of state director established. One institute in each county yearly. Appropriation. Md. 102, 27 Mr
- 1447 **Agricultural college to carry on in each county annually.** Report. Utah 67, 28 Mr
- 1448 **Act regulating and providing for support amended and extended.** O. p. 330, 27 Ap
- 1449 **Patrons of husbandry.** Penalty for unlawful wearing of badge. N. Y. 1002, 29 My

Soil—drainage, irrigation, fertilizers

(See also Eminent domain, 510; Dams, 1434)

- 1450 **Drains.** Jurisdiction of courts. Notice to all persons *affected* [formerly who have appeared]. Non-payment of assessment by a petitioner not to vacate proceedings. N. Y. 502, 11 My
- 1451 **Same provisions for notice of assessments for repairs or alterations, and for appeals therefrom, as on original construction.** N. Y. 819, 21 My
- 1452 **County ditches.** Liability of contractors. Filing of claims. O. p. 27, 19 F
- 1453 **Amending law as to fixing damages to one county by ditches from another county.** O. p. 338, 27 Ap
- 1454 **Providing for cleaning and assessment of cost.** O. p. 395, 27 Ap
- 1445 **Drainage districts.** Organization on popular two-thirds vote. Government. Taxes according to county assessment. Construction of works. No bonds. Utah 132, 16 Ap
- 1456 **Have right of eminent domain.** La. 125, 9 Jl
- 1457 **Levee districts.** Formation where U. S. authorities are constructing levees. Drainage works. Bonds. La. 46, 7 Ap
- 1458 **Irrigation.** Constitutional amendment allowing counties, cities, etc., to exceed debt limit for water for irrigation or domestic purposes, etc. *Adopted by people, 1896. See footnote c, p. 408.* S. D. 35, '95

- 1459 Constitutional amendment governing erection of reservoirs and appropriation of water rights. *Not voted on for lack of proper submission.* Ore. p. 613, 13 F '95
- 1460 Procedure for sale of water rights and works by irrigation districts when taxes unpaid. Utah 55, 19 Mr
- 1461 Fertilizers. Analysis and marking, tax, prosecutions, etc.; act amended. Mass. 297, 17 Ap
N. Y. 955, 28 My
Va. 848, 5 Mr
- 1462 Amending law as to seizure of adulterated. Miss. 68, 18 Mr
- 1463 Law does not apply to tobacco stems. Va. 215, 1 F
- 1464 Casternpomace included in definition. Miss. 65, 20 F

Pests. Hindrances to crops

- 1465 Horticulture. State board established, consisting of president and one member in each county. Spraying infected trees required. Utah 117, 5 Ap
- 1466 State entomologist established. To inspect nursery stock. Penalty for shipping if diseased. Certificates. Imported stock. Md. 290, 2 Ap
- 1467 San Jose scale. Inspector established. Destruction or treatment of trees. Va. 829, 5 Mr
- 1468 Prohibiting fastening animals to or in reach of fruit trees. N. J. 162, 14 Ap
- 1469 Weeds. Certain exempted from requirement of destruction. O. p. 106, 30 Mr
- 1470 Russian thistles. Penalty for not destroying. Procedure. O. p. 113, 1 Ap
- 1471 Act amended as to date of destroying and costs. Ia. 78, 10 Ap
- 1472 Animals. Counties on petition of 100 voters must establish bounties on noxious animals. Rates. Evidence. Utah 99, 5 Ap

Domestic animals

(See also Cruelty to animals, 54; Horse-racing, 14; Insurance, 1278; Shipment, 1306, 1308)

- 1473 Veterinary practice. General law. State board established. Va. 509, 27 F
- 1474 Contagious diseases. General law. Quarantine, importation, etc. Powers of agricultural experiment station. Va. 362, 18 F
- 1475 Killing diseased animals; state not to pay value unless animal is owned by person in state and has been in state three months. B. I. 844, 15 My
- 1476 Animals brought into state to show certificate of tuberculin test. B. I. 844, 15 My

- 1477 Use of tuberculin restricted till June 1, 1897. **Mass.** 276, 13 Ap
- 1478 Supervisors to employ veterinary surgeon to examine when glanders or farcy reported. **Miss.** 136, 18 Mr
- 1479 Prohibiting transportation of cholera-infected hogs. **O. p.** 388, 27 Ap
- 1480 More stringent regulations as to diseased swine. Sale or transportation while living or dead prohibited. **Ia.** 58, 2 My
- 1481 Sheep; repealing law establishing inspectors. All sheep must be dipped annually. **Utah** 50, 14 Mr
- 1482 Fowls; requiring burning or burial when dead from contagious disease. **Va.** 327, 14 F
- 1483 Running at large. Impounding. General law as to estrays and trespassing animals. When forfeited to state. Sale for damages. **Utah** 133, 16 Ap
- 1484 Amending law as to form of ballot in county elections on stock law or partial stock law. **Miss.** 131, 23 Mr
- 1485 What costs to be paid on recovery of estrays. **Va.** 514, 27 F
- 1486 Increasing fines and damages for trespassing animals. **Va.** 671, 3 Mr
- 1487 Line fences. Construction on banks of stream which forms boundary. **O. p.** 326, 27 Ap
- 1488 Law not to apply to counties having general stock law, except in municipalities. **Miss.** 130, 23 Mr
- 1489 Use of barbed wire for division fences authorized. **N. Y.** 524, 11 My
- 1490 Protection from theft. Prohibiting driving or branding ranging cattle by person not owner, or removing skin of dead animal. Liability of owner for damages. **Utah** 104, 5 Ap
- 1491 Increasing penalty for stealing cattle. **Miss.** 85, 4 Mr
- 1492 Hide of animal must be displayed on request. **S. C.** 97, 9 Mr
- 1493 Injury by dogs. (*See also Licenses, 450*) Damages may be recovered in every case. **Utah** 51, 14 Mr
- 1494 Disposition and collection of fines. **N. Y.** 680, 15 My
- 1495 Fraudulent pedigrees. Prohibiting publication or recording. **Utah** 11, 13 F
- 1496 Unwholesome meat. Prohibiting feeding certain impure substances to food animals. **O. p.** 97, 30 Mr
- 1497 Horseshoeing. Regulating practice in cities. Examination. **N. Y.** 271, 17 Ap

Dairy products

- 1498 State dairymen's association. Proceedings to be published by state. Ia. 101, 10 Ap
- 1499 Dairy products. General regulation. Standard milk. Imitation butter and cheese to be marked, and not to be colored.
Ga. p. 66, 16 D '95
S. C. 96, 9 Mr
Utah 60, 21 Mr
- 1500 Cream separators may be sold on conditional sales.
N. Y. 601, 13 My
- 1501 Provision for compensation to informers repealed.
O. p. 319, 27 Ap
- 1502 Imitation butter. Act amended. Extended to boarding houses.
Mass. 377, 7 My
- 1503 Cheese. Regulation and branding of substitutes, skimmed cheese, etc.
O. p. 51, 3 Mr
- 1504 Milk. Reducing slightly standard of solids required.
O. p. 149, 14 Ap
- 1505 Act amended as to definition of standard, marking skimmed milk and penalties.
Mass. 398, 15 My
- 1506 Inspectors may appoint collectors of samples. R. I. 333, 13 My
- 1507 Milk cans; protection of owners against use or detention by others; act amended. N. Y. 977, 28 My
- 1508 Condensed milk. Cans must bear name and brand of manufacturer.
Mass. 264, 11 Ap

Forestry

- 1509 Forest preserve. Actions for trespasses, and disposition of fines.
N. Y. 114, 25 Mr
- 1510 Constitutional amendment allowing lease of lands within preserve, or exchange or sale of lands outside preserve for purpose of procuring lands inside. *Rejected by people, 1896.*
N. Y. Concur. Res. 1
- 1511 Fire wardens. To be appointed in each town of certain counties. Duties; pay. N. Y. 655, 14 My
- 1512 Logs and lumber. Stealing is larceny. Search. Ia. 71, 14 My

Game and fish

- 1513 General law. State and county wardens established.
Utah 96, 5 Ap
- 1514 Miscellaneous amendments. N. J. 169, 14 Ap
- 1515 Parishes may pass ordinances protecting. La. 60, 8 JI
- 1516 Seizure of nets or illegal devices. N. Y. 661, 14 My

- 1517 **Officers.** Game wardens; office established. Deputies. Search and seizure of game or fish unlawfully held. Md. 293, 4 Ap
- 1518 **Fisheries, game and forest commission;** compensation, secretary to be appointed, office force. N. Y. 169, 31 Mr
- 1519 **Deputy fish and game wardens;** appointment authorized. To receive fees but no salary. N. J. 130, 30 Mr
- 1520 **Special game protectors may be appointed by request of majority of county supervisors or of a game club.** N. Y. 284, 17 Ap

Game

- 1521 **Changing close times and restrictions as to game birds, rabbits and squirrels.** O. p. 116, 1 Ap
- 1522 **Additional penalty for hunting on grounds of another, after being warned.** Va. 646, 3 Mr
- 1523 **Deer.** Open season September 1 to *January 1* [formerly February 1]. S. C. 100, 9 Mr
- 1524 **Jack-lights lawful only September 1-15.** N. Y. 654, 14 My
- 1525 **Deer-hounds running at large *prima facie* evidence.** N. Y. 652, 14 My
- 1526 **May be in possession during time when killing is prohibited.** O. p. 49, 27 F
- 1527 **Beaver.** Killing prohibited. N. Y. 463, 9 My
- 1528 **Rabbits and squirrels.** Close time January 1 to *September 1* [formerly October 1]. R. I. 306, 31 Ja
- 1529 **Game birds.** Close time extended to *November 1* [formerly October 1]. Ga. p. 75, 2 D '95
- 1530 **Prohibiting sale or transportation in close season.** O. p. 115, 1 Ap
- 1531 **Partridges;** prohibiting killing for two years. Va. 148, 27 Ja
- 1532 **Grouse and pheasants;** prohibiting transportation or sale. O. p. 114, 115, 1 Ap
- 1533 **Pheasants;** prohibiting killing till 1900. O. p. 117, 1 Ap
- 1534 **Antwerp pigeons.** Marking by ring or seamless leg-band. N. Y. 824, 21 My
- 1535 **Birds.** House-sparrows and robins may be killed if injuring fruit. O. p. 86, 25 Mr

Fish

- 1536 **General.** Provisions for Chesapeake bay. Md. 441, 7 Ap
- 1537 **Special provisions for Lake Erie.** O. p. 384, 27 Ap
- 1538 **Miscellaneous regulations;** consolidating and extending laws. O. p. 332, 27 Ap

- 1539 Special provisions for Thousand islands, St Lawrence river, and other streams. N. Y. 531, 11 My
- 1540 Corporations may be formed for fish preservation. Md. 114, 27 Mr
- 1541 Cars used by fish commissioners may use stoves. N. Y. 299, 17 Ap
- 1542 Increasing maximum fine to \$100 [formerly \$20]. Va. 214, 1 F
- 1543 No person to use more than two hooks. Ia. 80, 14 F
- 1544 Private parks. No waters stocked by state shall be made a private park to the exclusion of the public. N. Y. 319, 17 Ap
- 1545 Deleterious fish. Fisheries commissioners may permit taking carp, pickerel or other injurious fish by methods otherwise unlawful. N. Y. 462, 9 My
- 1546 Fishways. Amending law as to obstructions, nets, etc., in fresh water drains. Ga. p. 33, 14 D '95
- 1547 Seining. Prohibiting. La. 132, 9 JI
- 1548 Use of nets in boundary waters of state permitted. Ky. 34, 21 Mr
- 1549 Fishing from vessels with shirred or purse nets permitted on payment of license of \$25 to \$200 per year. N. J. 103, 26 Mr
- 1550 Fishing through ice. Prohibiting sheds, etc., or artificial heat. Ia. 80, 14 F
- 1551 Special kinds of fish. Stocking private ponds with trout or land-locked salmon permitted only with consent of fisheries commission. Penalties. N. Y. 368, 22 Ap
- 1552 Mountain trout; reducing penalty for unlawful taking. Va. 836, 5 Mr
- 1553 Bass and pike; taking regulated. Md. 427, 4 Ap
- 1554 Sturgeon and shad; protecting. S. C. 102, 9 Mr
- 1555 Eel-weirs and eel-pots; amending law. N. Y. 658, 14 My

Shell fish

- 1556 Shell fish. Seizure and sale of boats unlawfully taking. N. Y. 383, 23 Ap
- 1557 Lease of lands; jurisdiction of fisheries commissioners over controversies. N. Y. 657, 14 My
- 1558 Only persons having resided in state ~~at~~ [formerly 12] months shall take. N. J. 196, 21 Ap
- 1559 Crabs. Less stringent regulations. Va. 500, 27 F
- 1560 Scallops. Close time April 1 to October 1. Seed not to be taken. Mass. 268, 13 Ap

- 1561 **Lobsters.** Close time, November 15 to April 15. Not to be taken under *nine* [formerly 10] inches long. B. I. 318, 22 Ap
- 1562 **Oysters and terrapin.** Requiring license of \$500 to take for export from state, or to export. S. C. 103, 9 Mr
- 1563 **Oysters.** Commissioners established. Protection of seed oysters. Close season May 1 to October 1. N. J. 132, 30 Mr
- 1564 **Amending law.** Lease of grounds belonging to state. Miss. 129, 14 Mr
- 1565 **Amendments.** Repealing general property tax and readjusting license taxes. La. 121, 9 Jl
- 1566 **Amending as to license of boats and measuring of oysters, and reducing expenses of state fishery force.** Md. 418, 4 Ap

CONSTITUTIONAL AMENDMENTS

1895-96

NOTE — The references are to the marginal numbers in the body of the bulletin, where the amendments are summarized. The column of amendments proposed includes both those submitted to future vote of the people and those referred to the next session of the legislature, as is required in a number of states.

	Adopted	Rejected	Proposed		Adopted	Rejected	Proposed
California	219	186	.....	Minnesota ...	94	.....	.....
					188	.....	.....
		299	.....		191	.....	.....
Colorado		354	.....		417	.....	.....
Florida			181		513	.....	.....
			239		945	.....	.....
			618		1213	.....	.....
			639	Missouri		125	.....
			1214			611	.....
Georgia	74	.....	.....			382	.....
	609	.....	.....			987	.....
Idaho	79	.....	.....	Montana		189	.....
	186	.....	.....	Nebraska		96	.....
	650	.....	.....			219	.....
			.....			604	.....
Illinois		233	.....			607	.....
Iowa		27	235			608	.....
Kentucky .....		.....	453			718	.....
Louisiana		64	.....			862	.....
		187	.....			864	.....
		230	.....			950	.....
		240	.....			1288	.....
		402	.....	New York		1510	.....
		456	.....	Oregon ^b			101
		458	.....				175
		603	.....				455
		620	.....				610
		802	.....				1459
		869	.....	South Dakota ..	26	.....	.....
		1129	.....		134	.....	.....
		1205	.....		352	.....	.....
		1430	.....		457	.....	.....
Maryland .....		.....	459	Texas	190	95	.....
Massachusetts ..		234	.....	Virginia		1073	.....
		861	.....	Washington ..	184	.....	.....
			.....	Wisconsin		73	.....

^a It has been impossible to learn the result of the vote on these amendments. It is probable that they were adopted.

^b These amendments were proposed by the legislature of 1893 and approved by the legislature of 1895, but, apparently by oversight, the necessary special act regulating their submission to vote was not passed, and they have not yet been submitted.

^c Some question has been raised as to the legality of the vote on these amendments, owing to a technical error in the form of ballot, but the secretary of state on December 21 writes that they are declared adopted. The court has probably not yet decided the question.

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Appendix 3

State Library Bulletin

LEGISLATION No. 8

March 1897

STATE FINANCE STATISTICS, 1890 and 1895

Comparative Receipts, Expenditures, Funds and Debts

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State Library Bulletin

LEGISLATION No. 8

March 1897

STATE FINANCE STATISTICS, 1890 and 1895

Comparative Receipts, Expenditures, Funds and Debts

INTRODUCTION

In 1891 the New York State Library published in connection with its legislative bulletin two tables showing receipts and expenditures by states for their fiscal years ending in 1890. The tables herewith presented have a somewhat different scope, the most important changes being the classification of receipts according to source rather than by the funds to which they are assigned and the addition of statistics relating to endowment funds and state debt. For convenience in comparison, as well as to avoid misconceptions due to modifications in the methods of obtaining and grouping figures, the statistics of 1890 have been completely revised and are printed side by side with those for 1895.

The organization and functions of the various departments and the methods of bookkeeping differ so widely among the states that comparison is very difficult. The figures given in official reports have often to be entirely regrouped and in many cases sums twice counted must be eliminated. An attempt to verify the figures in the following tables by reference to the reports on which they are based would in many instances result in confusing one who did not understand the uniform method employed in the compilation. *It is of great importance accordingly to read the accompanying explanations.*

In view of the many complications in the accounts of 45 states it can scarcely be hoped that some errors, due either to misunderstanding-

ing of items or to wrong judgment in grouping them, have not occurred, but great care has been taken and it is believed that these tables are substantially accurate. Thanks are due to the many state financial officers who have promptly furnished their reports, some of them in the form of advance sheets; and particularly to those who have given specific information explaining or supplementing published figures. It is hoped that these tables may be practically helpful to all state financial officers, to legislatures in considering their budgets and to students of finance. Inquiries concerning doubtful points or suggestions for improvement will be gladly received by the legislative librarian, E. Dana Durand, Ph. D., who has compiled the tables and made the needed foot notes and explanations.

MELVIL DEWEY, *Director*

EXPLANATIONS

The figures given are taken, with few exceptions, directly from the state financial reports; but it has been necessary in the case of Maine (1890), Delaware, Maryland, Virginia, Arkansas and Colorado to supplement these by the appropriation acts and general statutes, particularly to obtain the salaries of officers. Slight discrepancies accordingly appear here, and in Colorado for 1890 a considerable one. Occasionally an item from some other source has been inserted. The report of the auditing officer, known usually as the auditor or comptroller (in Wisconsin and Oregon the secretary of state acts as auditor) has been generally used. In Maine and New Hampshire, where no such officer exists, the treasurer's report has been employed; while for supplying figures not found in the auditing officer's reports those of the state treasurer have been consulted.

The various state fiscal years ending during or at the close of the calendar years 1890 and 1895 respectively have been chosen for comparison, as it has been impossible to obtain the reports for 1896 from all the states in time. In South Dakota the large defalcation by the treasurer in 1895 so complicated the accounts that figures for 1896 are given; payments and receipts specially on account of the deficiency caused by this defalcation being omitted. Other figures not being available the reports of Wyoming for 1889 and of Utah for 1889 and 1896 have been employed. Arkansas, Illinois, Iowa, Nebraska, North Dakota, Colorado, Oregon, Idaho, Utah (1889) and Washington give figures only for biennial terms (though in Washington the receipts for each year are shown separately). In these cases half of the total item is taken,

except for the expenditure for the legislature, which falls entirely in one year; the totals of expenditure take into consideration the latter fact. In general, where the distinction appears in the reports, the amount of warrants drawn is taken as the expenditure for each purpose, rather than the amount of cash actually paid. In several states where this method is adopted for the separate items it has been necessary to give the totals of actual cash expenditures. The discrepancy is slight except in Nebraska, Montana, Colorado and Washington where the warrants annually drawn are much in excess of the cash receipts, so that a large floating debt is being accumulated.

Aside from these complications in the totals, there are two other important eliminations. 1) Under the separate heads of income the sums received for addition to the capital of endowment funds are given according to their source—almost exclusively public lands. But these sums properly belong with neither current revenue nor expenditure, and they are accordingly eliminated in columns 22 and 72. The amount of such additions to endowment funds appears in table C. Mere reinvestments of fund securities are of course disregarded. 2) The interest on endowment funds is usually not all net revenue, but is paid wholly or partly out of the state's own treasury. In some instances this fact might be safely disregarded, but in Michigan, Illinois and many other states it is necessary to eliminate. In these cases the state has given irredeemable bonds for the amount of its educational funds and annually pays not merely the interest but a large surplus for educational purposes, the interest being thus clearly not a receipt but an expenditure only. For uniformity that part of the income of endowment funds coming from the state itself has been omitted in every case, when possible, even though of small amount. While the columns of income in table C show the total interest, column 20 gives only the net amount received from outside sources as interest on endowment funds. Similarly column 68 gives the total expenditure for interest, including the amount on endowment fund bonds, but as these sums also appear as educational expenditures they are subtracted in obtaining total expenditures. So far as separate sinking funds exist, the receipts into and payments from these have been omitted (see under column 69). Receipts from the issue or refunding of bonds, and payments out of moneys thus received are disregarded.

In several states the central government collects certain taxes for distribution to local authorities, which appear as state receipts and disbursements. These and other sums, not needing specific mention, which do

not constitute actual revenue or outlay for current state purposes, are all eliminated.

In using the footings of columns showing total state expenditures for specific purposes, the explanations in introduction and foot notes should be specially borne in mind. Such totals must be used with caution, owing to the great differences in the organization of departments and in the relative expenditure by state and local authorities respectively for various purposes. Somewhat less caution perhaps is necessary as regards the totals of receipts from different sources. The italicized figures, which have either already been counted once in other columns or do not properly belong to the year's receipts or expenditures, are omitted in the column (72) of totals by *states*, but they are included for the sake of fair comparison in the foot totals of *forms* of receipt and expenditure.

TABLE A. RECEIPTS

1 General property taxes. Besides the distinction of school taxes, other classifications of property taxes according to the purposes for which they are levied are often made, but they are here disregarded. The Pennsylvania state tax is on personalty only. In Vermont the levy for general purposes is made only biennially, and one half has been taken as the amount for the year. Special annual highway taxes in addition have been levied since 1894. The taxes raised in and spent by the special levee districts of Louisiana pass through the general treasury. Some of these are levied on produce and on other objects besides general property, but all are placed in this column.

2 School taxes. The income from school taxes on general property only is here given. In many states a part or all the income from special corporation, poll or license taxes is also pledged to school purposes. In North Carolina the state fixes a certain amount which must be raised (\$717,192 in 1890, \$765,515 in 1895) but the money is collected directly by counties. Wisconsin provides for the levy of a definite sum annually, but in 1895 a sufficient revenue was realized from other sources so that the money was merely transferred from the general treasury account. Large payments for education are made by many states out of the general revenue, without levying a special school tax.

3 Incorporation fees and taxes. In several states for which figures are not given in this column, a part, which can not be separated, of the fees of the secretary of state, are for the organization of corporations; see column 14. The amount received in Pennsylvania for 1895 appears again under the separate classes of corporation taxes.

4 Corporation taxes. The figures in this column and the three following include only receipts from special modes of taxing corporations—taxes on capital, earnings, etc. In other states corporations are usually assessed to the general property tax, and railways in particular sometimes pay even larger sums proportionally in this way than in states levying special taxes. In most of the states represented in column 4, the tax is only upon telegraph, telephone, express or navigation companies, or upon all four of these classes. In Minnesota mining taxes are also included. The total for 1890 is increased by the Pennsylvania item, which includes railway taxes.

5 Railway taxes and fees. In Maine, Massachusetts, New Jersey, West Virginia, Missouri, North and South Dakota and California large amounts are collected by the state from special taxes on railways, and are then distributed to local authorities; such sums are excluded here. In many states the expense of state boards supervising railways, banks and insurance companies is assessed upon the various companies *pro rata*. Such assessments, or fees for inspection, often constitute the only receipts from these corporations. In Massachusetts the figure in this column represents only the tax on railways operating in foreign countries and the expenses of the commissioners; the great bulk of railway taxes being inseparable from general corporation taxes. The revenue in Illinois is exclusively from a tax of 7% on the gross receipts of the Illinois Central, paid in consideration of large early grants by the state, and perhaps more properly classed as income from public works.

6 Bank taxes and fees. In the New England states these taxes are chiefly from savings banks. Revenue from trust companies and building-loan associations is included. See also explanations under Railways.

7 Insurance taxes and fees. In the states where the receipts from this source are small they usually consist of fees only, a uniform sum being often required annually from each company. Taxes proper are frequently proportioned to the premiums collected in the state. See also Railways.

8 Inheritance taxes. New York and Ohio are the only states where direct as well as collateral inheritances are taxed. Small inheritances are usually exempted.

9 Poll taxes. These are generally devoted to schools. The revenue in Mississippi does not pass through the state treasury, but is levied by state law.

10 Taxes on legal proceedings. These figures do not include ordinary court fees and fines, which, when they come into the state treasury at all, are grouped with Fees, column 14. In several southern states a distinct state *tax* is levied upon suits, writs, conveyances, etc. In Tennessee certain fees and fines are also included; the figures are somewhat uncertain.

11 Business licenses. These do not include the small sums often charged for purely regulative purposes on peddlers, physicians, fertilizer manufacturers and other occupations, which are grouped in column 14, but only the license taxes proper, for revenue, found chiefly in the south. In some states it is impossible to distinguish the amount from liquor licenses from the general license receipts. In the two Carolinas the revenue is almost exclusively from fertilizers, but it constitutes a real *tax*.

13 Special taxes. The New York tax is on the receipts of racing associations. In Connecticut a special tax on mortgages negotiated by investment companies was established in 1889.

14 Fees, fines, special licenses, etc. Fees from corporations, where they are separable, are given in preceding columns. In some states certain court fees and fines come to the state which elsewhere go to local treasuries. Licenses of small amount intended solely for regulation are grouped here.

15 Prison and reformatory earnings. In the northern states convicts are employed generally within the prison, and the figures given represent gross receipts. The cost of providing labor itself often exceeds the revenue. In the south prisoners are usually let out to contractors, direct state expenditure is small and a considerable net income is often obtained; while sometimes the convicts are worked by public officers but are made practically to pay the entire expense of their maintenance. In such cases the receipts and expenditures often do not pass through the state treasury, but where they could be ascertained they are here given.

16 Public works. For the most part these items represent interest, dividends on state stocks or rental paid by railways aided by the state. The amount in Pennsylvania for 1890 is increased by the last exceptionally large payment by the Pennsylvania railway of the 'commutation of tonnage tax,' which was in reality purchase money for the state's right in that road. In Minnesota and Wisconsin the entire receipts from tuition fees, gifts, etc. to state educational institutions pass through the

state treasury and are classed here. The California receipts are from San Francisco harbor dues; those in Ohio and Illinois from canals.

17 Public lands. The United States government has granted a large amount of land to states for public schools and other educational and charitable purposes. Receipts from sales of land are usually added to the capital of endowment funds; they appear in this column but not in the total of ordinary revenue receipts; see table C. Interest on deferred payments usually is a proper revenue receipt, being used currently for the purpose represented by the grant. The New Jersey receipts are from leases of tide lands for wharf and other purposes.

19 Refunds by localities. In general mere refunds have been omitted from the tables, but in certain cases they represent a mode of distributing a burden met in most states by general tax. Part of the receipts in Massachusetts and all in the other states are for the support of insane, poor or other dependents in state institutions. Counties or towns are charged with the expense in proportion to the inmates coming from each. In Massachusetts for 1895 a large proportion of the interest on the public debt was refunded by Boston and the neighboring districts benefited by the Metropolitan parks, sewerage system and other enterprises for which the state has recently issued bonds.

20 Net interest of endowment funds. These figures give the total actual income from other sources than the state's own treasury, of educational and other endowment funds (exclusive of sinking funds). See also above p. 431.

21 Miscellaneous. A considerable proportion of these amounts consists of the annual donations made by the United States government to agricultural colleges and to soldiers' homes. In New York \$688,576, constituting the 'college fund,' was transferred to the general revenue fund in 1895, the state agreeing to pay interest perpetually on the amount.

22 Totals. The eliminations and additions made in obtaining these totals have been described above (p. 431). Certain receipts from prisons and from school taxes not passing through the state treasury, but given in the preceding columns, are here included.

TABLE B. EXPENDITURES

23 Legislature. In all but six states, New York, Massachusetts, Rhode Island, New Jersey, South Carolina and Georgia, legislative sessions are biennial, but where no session occurred in the fiscal year

covered by these tables the expenses of the session for the preceding (in one or two instances the following) year have been inserted in italics for comparison and included in the totals at the foot though not at the end of the table.

24 Executive. Governor, lieutenant-governor, and where it exists, executive council.

25-28 Secretary of state, attorney-general, treasurer, auditor. The character and extent of the duties of these officers differ greatly in different states; hence the wide variations in the expenditures for them. The supervision of banks and insurance companies, and the management of public lands frequently falls to the treasurer or auditor, sometimes to the secretary of state.

29 Public printing. The expense of printing is usually greater in years when the biennial legislative session occurs. The cost of printing court reports is here included. The printing of records of veterans and similar documents is placed under Soldiers' relief (column 49).

30 Judiciary. Here, as with many of the succeeding classes of expenditure, there is wide difference among the states as to the proportion of the expense borne respectively by state and local governments. Comparison is accordingly apt to be misleading. In Vermont, Rhode Island and Connecticut nearly all courts are supported by the state, but usually only the supreme court and the court of next inferior grade are so maintained. In the southern states the larger part of the state's expenditure is usually for costs in criminal cases, often entirely a charge on the central treasury. The cost of apprehending or extraditing criminals, rewards, etc. is included here. In Ohio no distinction can be made between criminal court costs and the expense of transporting convicts, and the entire sum is placed in this column.

31 Militia or national guard. Military schools are placed with higher education. Reprinting of civil war records by the adjutant-general is grouped with expenditure for veterans. The sums for West Virginia and Michigan, 1895, were increased by calling out troops to suppress riots.

32 Public schools. Great differences exist among the states as to the proportion of expenditure by state and local authorities respectively. In a few cases (North Carolina, South Carolina, Montana, Wyoming; and Vermont, South Dakota, North Dakota, Idaho and Washington for

1890) the state's outlay is practically limited to supervision by the department of education. In most states there is also a state school fund, usually derived from United States grants of land, and the income from this (including interest on deferred land sales) must also be distributed to local authorities. The distribution of such funds and the cost of state supervision constitute the entire state expense in Massachusetts, Louisiana, Tennessee, Iowa, Kansas, Colorado, South Dakota, Nevada, Oregon and Idaho. In all the other states an additional distribution, often large, is made to local authorities from the general revenue or from the proceeds of a special school tax. Sums added to endowment funds are excluded here. See also p. 431, 443.

33 Normal schools. Including expense of teachers' institutes and examinations where separable from other school expenditures. In some states endowment funds exist; see table C.

34 State universities, etc. This column includes professional schools. In most southern and several eastern states there is no distinct state university but aid is granted to private institutions. In Virginia and Tennessee specially such institutions hold large amounts of state bonds. Endowment funds, based on United States grants, exist in many states; see explanations under Schools. The University of the State of New York is a state department supervising all incorporated high schools and academies, and also all other secondary schools, and including all higher professional and technical educational institutions in the state. The cost of supervising these higher institutions not being separated from that for supervising secondary education, the expenditure of the department (except that for libraries) is grouped with public schools. In most states the expenditure for the state university includes only the amount appropriated outright, the general receipts (from tuition, gifts, etc.) and disbursements of the institution not passing through the state treasury, but in Minnesota and Wisconsin the receipts of the university from all sources go to the state and the gross expenditures are given. In these same states and in Ohio, Illinois, Nebraska, California and Nevada, the agricultural college is united wholly or partly with the university.

35 Agricultural and industrial education. A large part of these expenditures are either from funds created by earlier United States grants of land or from the annual cash distribution now being made by the United States government for agricultural and mechanical colleges. In

a few of the New England states and in New Jersey textile and similar industrial schools are also maintained. The expense of farmers' institutes and of experiment stations is classed under Agriculture (column 59). See also Universities.

36, 37 State and local libraries. Except in the larger and older states the state library consists almost exclusively of law books intended for the use of the legislature and courts. The court reporter or marshal sometimes acts as librarian; the secretary of state occasionally holds the same position. New York, the New England states and one or two others have recently begun the supervision and aid of local public libraries, New York being far in advance in the matter. The expenditure by Kentucky in 1890 is hardly of this same class.

38 Prisons. See remarks under column 15. In Maine, New Hampshire, Pennsylvania, Delaware and Wisconsin local authorities support the convicts, the state merely paying the officers and general expenses. Specially in the south prisoners are worked in camps by contractors and cost the state little, while in some other states the prison receipts and expenditures do not all pass through the state treasury and can not be ascertained.

41 Insane. In several states (e. g. New Hampshire, Massachusetts, Maryland, Pennsylvania) the insane, deaf and dumb, and blind are supported by towns or counties, the state merely furnishing buildings, paying the administrative expenses and supporting such patients as can claim no local settlement. In some of the middle western states a similar practice prevails, but the contributions by counties pass through the state treasury (see column 19) so that the gross expenditures appear in this column. In most central, southern and western states however practically the entire maintenance of defective classes is a state charge. The expense of special asylums for the criminal insane is here included.

42 Feeble-minded. The movement to provide separate care for idiots, feeble-minded and epileptics is comparatively recent. In some cases expenditures for these classes can not be separated from those for insane. See also explanations under Insane.

43, 44 Blind, deaf and dumb. In many cases joint institutions exist for these classes and the expenditure for each separately can not be distinguished. Fewer states maintain their own institutions than in the case of the insane; although the central and western states mostly do so.

The others either make donations to private institutions or pay for maintaining indigent inmates in such institutions; the latter is largely the case in New York. See also Insane.

45 Hospitals. Practically all such expenditures consist of gifts to private institutions.

46 Orphans. Most states leave the care of orphans to private charity. In New York, Maryland, North Carolina, Oregon and Idaho the expenditures consist of gifts to private institutions. In Pennsylvania, Ohio, Indiana, Illinois and Kansas the outlay is wholly or chiefly for soldiers' orphans. The 'state public school' of Michigan, Wisconsin and Minnesota is here included.

47 Poor relief. Except in Massachusetts, Rhode Island and California, the local authorities are charged with the bulk of poor relief, and only the two first named maintain state institutions. The expenditures in the other states are either for the relief of paupers not able to establish a settlement (New York, Maine, and Connecticut), for the aid of private charitable institutions (Maine, Iowa and Oregon) or for special aid to farmers and others suffering from drought or fire. The latter expenditures are usually in the form of loans.

48 Soldiers' homes. These figures include, usually, the large contributions made by the United States government for the support of such institutions. Institutions for veterans' orphans are grouped in column 46.

49 Soldiers' relief, etc. This column includes all expenses growing out of the civil war except those for soldiers' homes and monuments. Maine and Massachusetts are the only northern states paying regular pensions to veterans. In Rhode Island, Connecticut and Minnesota special aid is granted to poor soldiers and the state contributes to the burial expenses of deceased veterans. Most southern states pay regular pensions to poor or maimed confederate veterans. The expenditures assigned to the other states are chiefly for the compilation of military records.

50 Soldiers' monuments. The erection and care of state memorials in general, statues, etc. are included here, but soldiers' monuments and military or battlefield parks cause far the larger part of the expenditure.

51 Taxation. In the few southern and central states where the sums are large, the state itself has charge of the assessment and collection of

taxes, usually left to local authorities. In other states the expenses are, for the most part, for equalizing assessments between different counties, or for assessing railways and transportation companies. A considerable part of the outlay for the state treasurer or comptroller often goes for the collection of taxes. In Louisiana the commissions on taxes and other revenues, deducted from gross receipts, are treated as an expenditure. In Pennsylvania the expense is chiefly in collecting business license taxes.

52 Railway department. In a few states the secretary of state or auditor has charge of railway supervision. In Pennsylvania the department of internal affairs has this task and also collects labor and tax statistics; in 1890 it had some control over banks.

53 Insurance department. In a large number of states the auditor has the supervision of insurance companies; in a few the secretary of state or treasurer. Very few are entirely without the department in some form.

54 Bank department. In several southern states the state treasurer has supervision of banks. In South Dakota, North Dakota, Montana and some other western states a 'public examiner' is charged with investigating the accounts of state officers and institutions, of local officers, and of banks. The expenditures for such examiners are treated as miscellaneous in these tables.

55 Public Health. In a few states small sums are spent by special boards of examiners in medicine, dentistry and pharmacy, and are here included. The considerable amounts expended for inspecting livestock and meats are largely designed to promote public health, but are grouped with Agriculture. See also Dairy and food inspection (60).

56 Labor statistics and factory inspection. In several states there are separate departments for labor statistics and information and for factory inspection, while in others a single department performs both functions. In Massachusetts the 'district police' has as its chief duty the enforcement of factory laws, but it also inspects buildings and does other similar work.

59 Agriculture. Besides the expense of the state board which exists in most states and which collects agricultural statistics, maintains experiment stations, examines fertilizers, etc., New York, Massachusetts and several other states distribute considerable amounts to local agricultural societies for aiding fairs, carrying on farmers' institutes and for

other purposes. Specially of late years many northern and eastern states have spent large sums, sometimes through special boards, for inspecting live cattle brought into the state in order to prevent contagious diseases dangerous to human as well as animal health. In the grazing states of the west considerable expense is also caused by the inspection of livestock, partly to check disease and partly to prevent fraudulent branding or stealing of animals. The duty of encouraging immigration is usually left to agricultural departments and where separate boards exist their expenditures are here included, as are those for weather service, entomologic and horticultural investigations, etc. Minnesota spends much more than any other state for inspecting and weighing grain at terminal points; in several other western states the railway commission has some supervision over warehouses and grain shipment.

60 Dairy and food inspection. Expenditure for this purpose in some states is inseparable from that of the agricultural department or of the board of health.

63 Public lands. These expenditures include the cost of surveying lands, appraising for sale, collecting money from sales, etc., and are naturally greater in the western states where lands are not yet all disposed of. The work is sometimes performed by the state auditor, treasurer or secretary of state, but in such cases is usually unimportant. See also p. 431, and column 17.

64 Geologic and topographic survey. Topographic surveys are to be distinguished from the mere survey of state salable lands, coming under the preceding column.

65 Public works. These expenditures are for a greater variety of purposes than those in any other column. In New York, where they are chiefly for maintenance of the canals, a certain tax is fixed annually in advance and the full sum collected is turned over to the canal fund, which sometimes spends less, sometimes more, during the year. The amount so transferred from the general to the canal fund is here given. Large sums are now being spent out of the proceeds of bonds for deepening the canals. In Vermont, Rhode Island, Massachusetts and New Jersey the state has recently begun to aid in constructing improved roads, but in Massachusetts these expenditures are chiefly covered by loans. In 1890 Connecticut bought out the rights of the Hartford Bridge company and Pennsylvania spent \$200,000 in harbor improvements. Louisiana expends great sums on levees, over half of the amounts here given being spent in special levee

districts, and met by local taxes levied in such districts. Ohio's expenditure is for canals, Colorado's for bridges and irrigation works, California's for maintaining the harbor and wharves at San Francisco, and Oregon's for roads.

66, 67 Public buildings. The cost of constructing and maintaining buildings for special purposes—prisons, universities, etc.—is grouped with the specific subject (except the state library buildings of New Hampshire and Virginia). The expenditures in these columns are chiefly upon the state capitol. The cost of minor repairs is placed under maintenance. Wide variations in column 67 are partly due to the fact that in many states part of the janitorial and similar expense is grouped with special departments occupying the capitol, while in others it is classed as contingent or miscellaneous expense and can not be separated.

68 Interest. This includes interest on temporary or revenue bonds. Interest on bonds held by state endowment funds is here given although duplicated under the special purpose for which the endowment fund exists. The debt statements in table C will indicate approximately what proportion of interest is a proper interest expenditure. See also page preceding.

69 Reduction of debt. Where, as in Massachusetts, special sinking funds exist which accumulate interest on investments and from time to time make payments of bonds due, such receipts and payments are disregarded as not recurrent and ordinary. But where debt payments are made from the general state revenue, whether for addition to the sinking fund, for buying outstanding bonds, or redeeming bonds maturing in annual instalments, these are here given. In Pennsylvania all sinking fund payments are included in the general accounts and to save confusion are not omitted from this column.

71 Miscellaneous. The reports in some states group together contingent and miscellaneous expenses which in others are distributed among departmental expenditures.

72 Totals. These figures are obtained directly from the totals given in official reports, with the necessary eliminations of duplicated sums, rather than by adding the preceding figures. Figures italicized in the preceding columns and amounts duplicated in them (specially under interest on state debt) are omitted; on the other hand figures not found in the financial reports but obtained from other sources and included in the preceding columns (such as those showing the expenditures for prisons in certain states) are added into the totals. See also p. 431.

TABLE C. ENDOWMENT FUNDS

Educational endowment funds have in most states been transformed into obligations of the state itself. In such cases they simply constitute a pledge on the part of the state to pay a certain amount annually for the purpose named, an amount usually far exceeded by the actual appropriations. The 'fiction', as one of the state financial officers expresses it, must however be kept up because of the terms of the United States land grants under which practically all such funds have been established. These states have taken into their general revenue the capital of the endowment funds and issued certificates of indebtedness for the amount. Usually where this has once been done further receipts from time to time to the credit of the fund are immediately turned into the general treasury and additional certificates issued; but in some cases (e. g. Wisconsin) such receipts have been invested in other securities, at least for a time, so that the fund consists of two essentially different parts. Even in states where the general plan just outlined is not followed, part of the endowment funds is often invested in state bonds.

The columns of receipts from endowment funds show the total interest on the funds, whether from outside investments, in which case they constitute actual revenue, or from the state itself, when they are simply a form of expenditure and appear as such in table B under interest as well as under the column for the appropriate educational purpose. The net amount of actual revenue from all these funds collectively is shown in table A, column 20. That column together with the footnotes to table C will make clear the actual character of the endowment fund securities in each case. In several states where no footnotes are appended small amounts of state bonds are also held by these funds.

The amounts added to endowment funds consist almost solely of moneys from the sale of lands, but occasionally certain fees and fines or the receipts from escheated estates go to the capital of endowment funds.

State financial reports often fail to give statistics as to endowment funds. Some figures for 1890 have been supplied from the U. S. census. A few for 1895 are estimated as the same as in 1890—such being preceded by A. They are not far from correct, as in these states the additions to endowment funds are very slight at present.

Besides educational funds a few minor endowment funds exist in certain states; their income is included with miscellaneous receipts.

73-75 School fund. In New York the amount given is composed of three different funds, and in some other states it is composed of two different funds. In New York part of the revenue of the Literature fund goes to local libraries.

76-78 University fund. This fund is often known as the 'seminary' or 'college' fund. In Indiana the state appropriates annually a considerable sum for loans to students, and the amount so outstanding is designated as permanent endowment; the figure for 1890 can not be ascertained. In Illinois the interest of the seminary and college funds goes to the state normal schools, so that the figures have been given in columns 82-84.

82-84 Normal school fund. The Massachusetts fund was founded by a private gift, the others from the sale of public lands.

TABLE D. STATE DEBT

85-87 These figures represent gross outstanding debt, regardless of sinking fund accumulations, which exist in several states. From what has been said above it will be seen that the amount of bonds or certificates held by endowment funds is usually not a state debt in the same sense as bonds held by individuals. Small amounts of floating debt—warrants outstanding and revenue bonds incident to the ordinary transaction of business—are here omitted; but in Nebraska, Colorado, Montana and Washington, where the state is accumulating a large floating debt by expenditures in excess of revenue, such indebtedness is included. Unpaid interest on bonds, often very large sums in southern states, is also included. Some southern states have besides the amounts here given certain old debts which they refuse to recognize, and several of them have refunded their debts at a considerable discount. The figures for 1890 have been supplemented in one or two cases by the United States census. In Massachusetts the state has recently issued large amounts of bonds in aid of the Metropolitan park district, Sewerage district and Water district; the payment of principal and interest on these is guaranteed by the municipalities constituting these metropolitan districts.

COMMENTS

It is impossible in brief space to call attention to all the interesting general facts and tendencies brought to light by these financial tables, and still more so to comment upon the figures for individual states. A few of the most important features as regards the states as a whole may however be indicated, with some mention of the movements shown in our own state during the past half decade.

The states collectively seem to have followed to a less degree the recent financial course of the United States government, their aggregate budgets showing a surplus in 1890 and a deficiency in 1895. The receipts of the former year were \$111,195,003, of the latter \$124,925,920, an increase of about 12%; while expenditures meantime rose from \$105,904,997 to \$129,129,225, or 22%. This discrepancy in the growth of revenue and outlay may however be partly accidental, for a glance at the relative receipts and expenditures of the individual states shows how little attempt is made in most to preserve a close balance between the two sides of the budget for any single year. At any rate, certain indications of other figures make one hesitate before charging our state legislatures with growing extravagance and recklessness.

Another fact to which attention is directed by these totals is the relatively small amount spent by states as compared on the one hand with the federal and on the other with local governments. The total expenditures by the 45 states in 1895 were barely a fourth of those of the United States treasury, while New York city alone spent 40% as much as all the states combined.

New York state, as might be expected from her population and wealth, stands at the head of the commonwealths in the total of annual expenditures, her outlay amounting to about one ninth of the entire sum spent by them all. She spent \$13,170,067 in 1890, \$15,775,374 in 1895. Almost \$1,500,000 of this increase, which is at precisely the same rate as that for the expenditures by the states collectively, was due to the assumption by the state during the interval of the entire support of the insane. Pennsylvania follows New York closely, spending \$12,106,682 in 1895; while for the next state in order we have somewhat unexpectedly to cross the continent to California, whose budget for 1895 was over eight millions. Massachusetts, Ohio, Indiana, Texas and

Illinois, which follow in the order named, comprise all the states that spent more than \$5,000,000 in that year. It is noticeable that the wealthy North Atlantic states generally have increased their gross expenditures more rapidly than have the states of any other group. They spent \$36,489,893 in 1890, \$46,748,814 in 1895.

Receipts. The most noteworthy movement displayed in state revenues of recent years is the growth of taxation on corporations and on inheritances. While taxes on general property (including those levied for school purposes) continue to furnish over half the income of our commonwealths—\$68,276,029 in 1895—such taxes increased but a bare 3% during the last half decade. Indeed if we count out special school taxes there was a slight decrease in the amount raised in this way. On the other hand the revenue collected from taxes on miscellaneous corporations and on railways taken together rose from \$12,354,864 in 1890 to \$16,908,112 in 1895, 38%. Taxes and fees from banks and savings banks increased in nearly the same proportion, from \$3,205,640 to \$4,142,412, while insurance companies swelled their contribution from \$3,076,173 to \$4,361,984. Far more rapid still is the increase in inheritance taxes, which amounted to \$1,886,509 in 1890 and to \$4,016,841 in 1895. In the former year only five states received income from inheritances; in the latter 12 were actually using this method of taxation, while two or three more had adopted laws which their courts had declared unconstitutional. At least three states, moreover, have established the tax since 1895.

Our own state shows this tendency toward special taxation in a very marked degree. The annual burden on general property was actually reduced nearly \$3,000,000 during these five years, while corporation, railway and inheritance taxes well-nigh doubled and in 1895 contributed fully \$4,500,000 to the state treasury. While the inheritance tax law passed by New York in 1885 was by no means the first in this country, it was to large extent the immediate influence which led to the numerous measures of the last 10 years in other states. By extending the tax to direct as well as collateral inheritances the state has secured nearly twice as much from this source in 1895 as in 1890. Under the Raines liquor tax law even less direct taxation is now necessary than in 1895. Massachusetts and Pennsylvania have gone even further in the use of these various classes of indirect taxes. The former collects barely a fifth of her revenue from general property taxes and the latter less than a twelfth, while Connecticut and Delaware have abandoned such taxes altogether and Wisconsin very nearly so.

The next most important source of state income is from licenses on business and professions and on the sale of liquors. The somewhat unsatisfactory practice of collecting revenue by means of license taxes upon those engaged in any trade or profession still prevails generally in the south as well as in Pennsylvania and one or two western states, \$3,204,993 being raised in this way in 1895 by the 17 states which employ this form of taxation. A somewhat larger income is derived from liquors, but all northern states save three or four leave this source of revenue to local authorities. The amount collected by New York in 1896 under the Raines law was nearly as much as was received by all the other states in 1895.

The chief other sources of revenue are convict labor, public works (mainly payments from railways aided by the state), public lands and the interest on endowment funds. A few southern and western states still obtain some revenue from poll taxes.

Expenditures. The first fact which will be noticed in these tables is that the state legislatures themselves, which control the purse strings, appropriated scarcely more for their own maintenance in 1895 than in 1890 (the figures of the preceding year being included in each case where the biennial legislative session does not fall in the fiscal year 1890 or 1895). The expenditures for state printing, which depend more directly on the legislature and are perhaps more subject to illegitimate influences than any other item, increased indeed over 30%; but this is largely due to the fact that many states print official reports biennially and that a greater number of biennial sessions were held in 1895 than in 1890, which would naturally require greater outlay for legislative printing. The expenses of the New York legislature rose, however, from \$421,036 in 1890 to \$625,588 in 1895, nor is this due to the increase in the number of members in the legislature which did not take effect till 1896. The 1895 session was somewhat longer than usual. New York's printing expenses in 1895 were treble those of 1890, but this is partly explained by the inclusion of a large sum for constitutional convention printing.

In most states the expenses of the regular executive departments—governor, treasurer, secretary of state, attorney-general and auditor (or comptroller)—show only moderate increase during these years, but exceptionally great additions by one or two states cause a considerable growth in the total expenditures for the three departments last named.

For instance, the rise in the expenditures of state comptrollers from \$436,539 to \$609,724 is chiefly due to an increase in New York from \$49,417 to \$139,439, which in turn is explained by the great additions recently made to the duties of the department. In New York the governor's department is almost the only branch of government where an absolute decrease of expenditure took place in 1895 as compared with 1890. State expenditures for the judiciary, which aggregated over \$9,500,000 in 1895, vary greatly among the states, according to the proportion of court expenses borne respectively by the central government and by local governments. For this reason only do we find that Texas, Kentucky, Missouri and Pennsylvania, in the order named, surpass New York in the outlay for the administration of justice. A general reorganization and extension of state military forces has been made of late years, and has caused an exceptionally rapid increase of expenditure for this purpose, but the total of \$4,219,461 in 1895, considered in conjunction with our national military budget, must seem ridiculously small to European countries with their immense armaments.

By far the largest object of state expenditure is the support of public schools. Here, moreover, as well as with expenditure for higher education of all kinds, the increase since 1890 has been much more rapid than that in most other directions.

	1890	1895
Public schools	\$30,280,909	\$39,606,165
Normal schools	1,557,347	2,621,416
State universities	2,541,327	3,683,958
Agricultural and industrial education...	953,203	1,466,947
Total.....	<u>\$35,332,786</u>	<u>\$47,378,486</u>

Over 37% of the money spent by states in 1895 was for educational purposes and this class of expenditures in that year was more than a third greater than in 1890. The increase in this direction accounts for over half the total growth in state budgets during this half decade. While New York has increased her outlay for public schools only from \$3,952,142 to \$4,493,589 in the past five years, this relatively slow movement is explained by the fact that already in 1890 she had set a high mark and adopted a satisfactory policy, while in several states central aid to schools is a comparatively new feature. The most striking figures are those of Pennsylvania which in 1895 contributed \$5,900,000 to schools, nearly three times as much as five years before. Of even greater significance

however is the exceedingly rapid increase in school expenditures by Georgia and Mississippi, in the very heart of the 'black belt.' The states which spend most upon their universities are the closely adjoining commonwealths of Michigan, Wisconsin and Minnesota, but several other north central and western states are rapidly increasing their appropriations for this purpose.

Another recent educational movement, that of state supervision and aid to local public libraries, which had barely begun in 1890, has now reached half a score of states and involves an expenditure of \$58,798, over half of which is by New York, which was the first state to establish and maintain a department wholly devoted to the interests of public libraries.

Next to schools and educational institutions the most important objects of state expenditure are penal and charitable institutions. The outlay for prisons was \$5,797,955 in 1890 and very nearly a million more in 1895. The revenue from convict labor as shown by the table of receipts is equal to nearly half these sums. In the northern states, however, the proportion borne by prison receipts to prison expenditures is much less. In the south convicts are often hired out to labor in camps or chain gangs on terms that bring an actual net revenue to the state—a system which appears economical at first thought but which is practically a remnant of barbarism. Fortunately a few southern states are now moving for better and more scientific treatment of criminals. The growth of the movement for special treatment of juvenile offenders, which has not yet reached the south, is well indicated by the increase in expenditure from \$2,636,965 in 1890 to \$3,939,044 in 1895, about 50%. New York swelled her outlay for this purpose from \$496,000 to \$904,855 in the same period, though the large amount in 1895 is partly due to the cost of new buildings.

The expenditures for the blind, deaf and dumb, and orphans, which amount to between one and two millions each annually, show an increase somewhat less than the average. The same would have been true of the outlay for the insane had not our own state recently taken over the entire support of lunatics, involving an expense in 1895 more than double that in 1890, and likewise more than double that in any other state. In Pennsylvania, Massachusetts and several other states local authorities are still charged with much of the expense of supporting the insane. The care of this class requires an expenditure greater than that for any other single purpose except public education, amounting to \$13,727,052 in 1895. The growing tendency to provide more suitable treatment for idiots and epileptics apart from the insane is manifested by an increase

of expenditure for these dependents from \$1,333,037 to \$1,874,809 during five years. Less than half the states, however, make separate appropriations for maintaining feeble-minded persons. The same is true of appropriations for hospitals, orphans and poor relief, which are usually left to the support of private charity, as is largely the case in New York. An interesting form of state expenditure is the payment of pensions by most southern states to disabled Confederate veterans. About \$650,000 was spent for this purpose by these states in 1890 and in 1895 the amount had risen to over \$1,100,000. Massachusetts and Maine in the north also appropriate large sums for pensioning soldiers, while in all the other northern states considerable expenditure is made upon homes for veterans.

Without dwelling in detail upon the expenditures of the various minor departments having to do with internal affairs, we may notice that several states have during the past five years established new departments for the supervision of insurance companies, banks, mines, dairy products and forestry, but only in the case of the two departments first named has there been considerable added expenditure. The most striking increase in expenditure has been for labor statistics and factory inspection — from \$295,100 in 1890 to \$464,908 in 1895 — and for aid to agriculture in various forms — from \$1,150,146 to \$1,855,361. A large part of the growth in the latter item is due to added outlay for inspecting live stock to prevent disease. In all these seven departments, as well as in those of railway supervision, game and fish, and public health, New York stands considerably in advance as to expenditure. She has nearly doubled her outlay in the insurance and labor departments since 1890. There has been a decrease in the somewhat heterogeneous expenditures of states for public works, entirely due to less expenditure by our own state on the canals. The outlay of New York on these and of Louisiana on levees comprises two thirds of this class of expenditure. A considerable decrease appears also in the large payments for interest on state debts, \$9,837,835 in 1890, \$8,156,558 in 1895. Nearly a third of the amount spent as interest goes into the treasuries of the states themselves as payment on bonds held by endowment funds.

Endowment funds. All but half a dozen of the states possess school endowment funds, mostly accumulated from receipts from lands granted to the states by the federal government. Indiana has the largest fund, nearly \$10,000,000, while New York follows with a million less. In most of the older states, where lands have been nearly all disposed of, the growth of these funds is naturally slow, but in the western states they

are still growing rapidly, though at a slower rate in 1895 than at the opening of the decade. In about half the states the whole or the greater part of the school fund has been turned into the general treasury, and the state has given in exchange irredeemable certificates of debt, binding it to pay, nominally as interest, a certain amount annually for public schools. The actual expenditure for education by many such states far exceeds the sum thus designated, so that the endowment fund has become a mere form. This fact may be understood by comparing the entire interest on school funds, \$5,174,136 in 1895, with the total expenditure for schools of over \$39,000,000 in that year. The same general remarks which apply to the state school funds hold true of the smaller funds pledged respectively to the support of universities, agricultural colleges and normal schools. The average rate of interest on endowment funds is a trifle over 5%.

Debts. In view of what has been said concerning the large amount of nominal state indebtedness represented by endowment funds, the importance of the distinction between debt held by individuals and that held by the state itself becomes apparent. The former, which constitutes the real indebtedness, is being reduced rapidly, amounting to \$203,804,575 in 1890 and to \$174,027,326 in 1895, while the latter has remained practically stationary, aggregating \$49,210,727 in the former year and \$49,157,336 in 1895. New York had a debt of over \$6,000,000 in 1890, but this was even then practically covered by sinking fund accumulations and was soon wiped out, so that only the 'college fund' obligations remained in 1895. Massachusetts has now the largest debt of any state, \$29,675,229, but about half of this is guaranteed by Boston and the surrounding districts benefited by the recent bond issues for the Metropolitan water, sewer and park systems. The southern states, and above all Virginia, whose debt is almost equal to that of Massachusetts, are still staggering under the burden of 'carpet-bag' debts; they owe over 60% of the total amount of state indebtedness. A few of them still find it impossible to pay the entire amount of annual interest charges.

TABLE A—STATE RECEIPTS

States	Fiscal year ending-	1 General property taxes		2 School taxes	
		1890	1896	1890	1896
No. Atlantic		\$	\$	\$	\$
New York	30 Sept.....	7,809,330	4,521,624	3,460,406	3,989,888
Maine	31 Dec.....	660,758	774,382	.....	.....
N. Hampshire.....	31 May	499,900	500,000	.....	.....
Vermont	30 June	176,706	202,289	.....	89,071
Massachusetts	31 Dec.....	1,749,212	1,499,710	.....	.....
Rhode Island	31 Dec.....	591,354	647,189	.....	.....
Connecticut	30 Sept.....	354,557	.....	.....	.....
New Jersey	30 Nov.....	.....	.....	1,939,235	2,119,360
Pennsylvania	30 Nov.....	923,939	732,916	.....	.....
So. Atlantic					
Delaware	31 Dec.....	.....	.....	.....	.....
Maryland	30 Sept.....	350,196	390,765	504,392	517,646
West Virginia	30 Sept.....	435,386	388,088	300,130	325,822
Virginia	30 Sept.....	1,288,909	1,557,960	.....	.....
North Carolina.....	30 Nov.....	642,401	644,809	.....	.....
South Carolina.....	31 Oct.....	744,638	845,708	.....	.....
Georgia	30 Sept.....	1,361,072	1,615,296	.....	.....
Florida	31 Dec.....	450,637	426,828	92,038	.....
So. central					
Mississippi	30 Sept.....	580,362	989,525	.....	.....
Alabama	30 Sept.....	1,027,109	1,160,266	.....	117,436
Louisiana	31 Dec.....	1,518,983	2,147,368	231,552	290,619
Texas	31 Aug.....	b 2,049,160	b 1,928,010	b 1,071,403	b 1,301,886
Arkansas	30 Sept. a	285,172	426,083	308,552	329,581
Tennessee	20 Dec.....	894,022	1,014,230	.....	.....
Kentucky	30 June	2,189,518	2,243,494	.....	.....
No. central					
Ohio	15 Nov.....	2,981,368	3,043,031	1,749,905	1,739,312
Indiana	31 Oct.....	1,128,321	2,630,292	1,478,625	2,087,329
Illinois	30 Sept. a	2,064,792	2,225,923	1,068,942	1,004,506
Michigan	30 June	1,878,964	1,915,000	.....	.....
Wisconsin	30 Sept.....	82,136	32,430	627,092	d 600,000
Minnesota	31 July.....	974,539	1,533,044	514,390	647,015
Iowa	30 June a	1,285,840	1,152,434	.....	.....
Missouri	31 Dec.....	2,261,028	2,308,695	673,902	685,174
Mountain					
Kansas	30 June a	1,404,416	1,330,172	.....	.....
Nebraska	30 Nov. a	1,076,759	890,500	143,917	253,879
South Dakota.....	30 June, '96	268,969	333,719	.....	.....
North Dakota.....	30 June a	139,361	350,834	.....	186,322
Montana	31 Dec.....	c 275,369	310,721	.....	.....
Wyoming	30 Sept.....	182,912	167,327	.....	.....
Colorado	30 Nov. a	697,753	819,449	.....	.....
Pacific					
Nevada	31 Dec.....	c 224,073	c 198,225	.....	.....
California	30 June	5,116,993	3,609,307	2,094,422	2,078,081
Oregon	31 Dec. a	480,163	869,818	.....	.....
Idaho	15 Nov. a	78,204	143,595	.....	.....
Utah	31 Dec. '96	219,550	653,884	109,775	.....
Washington	31 Oct. a	290,292	491,558	.....	e 246,604
Total.....		49,695,123	49,666,498	16,368,678	18,609,531

a One-half biennial figures. b Includes all following columns of taxes. c Includes business clubed under following corporation taxes. g Including railways and other corporations. local authorities. j Including small amount from electric and trust companies. k See also distributed to counties.

TABLE A—STATE RECEIPTS

3 Incorporation fees and taxes		4 Corporation taxes		5 Railway taxes		
1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	
220,719	258,464	354,389	655,937	693,812	1,108,492	N. Y.
20,700	25,755	h 8,059	h 15,594	72,694	99,785	Me.
4,280	1,697	h 4,476	h 5,287	117,967	136,316	N. H.
-----	-----	11,087	21,740	120,652	103,008	Vt.
-----	-----	gi 960,684	gi 1,010,243	k 53,216	k 80,144	Mass.
7,950	11,930	h 3,643	h 4,260	-----	-----	R. I.
5,000	1,000	95,665	112,425	784,206	816,125	Ct.
99,359	53,885	292,137	698,342	1,050,451	1,103,956	N. J.
168,710	f 241,789	g 3,197,982	2,084,143	k -----	2,872,461	Pa.
-----	-----	1,848	1,419	69,125	69,690	Del.
1,681	9,690	85,539	77,495	60,019	j 131,789	Md.
31,745	55,785	h 169	h 1,407	53,473	76,900	W. Va.
34,911	9,564	h 8,774	h 12,380	196,080	215,668	Va.
-----	2,150	h 1,735	h 3,991	60,676	54,191	N. C.
-----	-----	-----	-----	6,332	8,828	S. C.
-----	-----	h 8,277	h 10,824	164,002	197,747	Ga.
-----	8,696	-----	h 322	-----	-----	Fla.
-----	4,808	12,245	3,876	70,738	125,000	Miss.
-----	-----	h 6,463	22,515	20,331	23,137	Ala.
-----	-----	h 10,813	h 19,430	61,775	50,576	La.
-----	-----	-----	-----	-----	-----	Tex.
-----	-----	h 5,026	h 16,822	68,709	238,946	Ark.
-----	8,598	43,403	16,114	160,542	225,830	Tenn.
-----	-----	-----	h 9,966	9,040	15,355	Ky.
-----	31,490	h 1,728	-----	-----	-----	O.
-----	21,283	h 105,396	h 43,874	l 458,540	l 604,659	Ind.
-----	-----	h 13,833	h 21,519	669,881	836,049	Ill.
43,554	13,220	h 14,658	h 40,810	1,008,559	1,175,752	Mich.
-----	-----	h 19,340	h 19,982	702,367	851,394	Wis.
105,065	57,820	h 5,434	h 7,920	-----	-----	Minn.
-----	-----	-----	-----	-----	-----	Ia.
-----	-----	-----	-----	-----	-----	Mo.
-----	-----	-----	-----	-----	-----	Kan.
-----	-----	h 588	h 2,492	30,675	m 250,430	Neb.
650	1,465	-----	-----	25,802	24,306	S. D.
-----	-----	-----	-----	-----	-----	N. D.
-----	-----	-----	-----	-----	-----	Mont.
-----	-----	-----	-----	-----	-----	Wyo.
-----	-----	-----	-----	-----	-----	Col.
-----	-----	-----	-----	-----	-----	Nev.
-----	-----	-----	-----	292,409	470,449	Cal.
-----	-----	-----	-----	-----	-----	Ore.
-----	-----	-----	-----	-----	-----	Ida.
-----	-----	-----	-----	-----	-----	U.
-----	-----	-----	-----	-----	-----	Wash.
744,324	819,089	5,273,391	4,941,129	7,081,473	11,966,983	Total

license tax. d Transferred, in lieu of taxes, from general fund. e First levied in 1896. f In-
 A Telegraph and other transportation companies only. g Besides large amount distributed to
 Corporation taxes. h Illinois Central only. m Partly under General property tax; rest

TABLE A—STATE RECEIPTS

States	6 Bank taxes and fees		7 Insurance fees, taxes and licenses		8 Inheritance taxes	
	1890	1895	1890	1895	1890	1895
N. Y.	\$ 74,678	\$ 66,757	\$ 265,360	\$ 344,989	\$ 1,117,637	\$ 2,126,894
Me.	323,556	388,399	30,830	43,008	.....	42,284
N. H.	^a 55,137	^a 79,472	14,750	25,301	.....	.....
Vt.	108,814	194,637	32,433	44,923	.....	.....
Mass.	^a 1,506,958	^a 1,626,967	429,398	535,345	.....	431,107
R. I.	167,415	311,118	97,188	133,173	.....	.....
Ct.	252,886	327,008	290,135	331,520	14,600	68,806
N. J.	.....	.....	5,450	35,436	.....	121,339
Pa.	413,368	835,758	438,840	684,888	670,371	1,091,993
Del.	.....	9,500	400	16,469	.....	1,582
Md.	.....	26,516	65,324	124,401	83,656	83,105
W. Va.	.....	.....	12,177	19,736	245	1,026
Va.	37,559	46,695	44,451	64,982	.....	.....
N. C.	12,211	20,779	23,047	35,652	.....	.....
S. C.	.....	.....	7,484	11,400	.....	.....
Ga.	.....	.....	49,791	65,532	.....	.....
Fla.	.....	.....	.....	18,394	.....	.....
Miss.	.....	.....	35,750	40,900	.....	.....
Ala.	.....	4,000	11,400	21,270	.....	.....
La.	.....	.....	.....	.....	.....	.....
Tex.	.....	.....	42,337	70,035	.....	.....
Ark.	.....	.....	12,254	19,187	.....	.....
Tenn.	11,750	17,569	80,018	104,180	.....	.....
Ky.	225,954	149,674	137,495	130,912	.....	.....
O.	.....	3,135	54,976	99,444	.....	^b 15,603
Ind.	.....	.....	98,532	159,227	.....	.....
Ill.	.....	.....	82,438	164,238	.....	315
Mich.	.....	.....	159,625	209,233	.....	.....
Wis.	.....	2,598	120,388	160,046	.....	.....
Mian.	.....	.....	122,356	155,888	.....	.....
Ia.	.....	.....	87,305	152,216	.....	.....
Mo.	.....	6,662	^a 110,821	^a 136,726	.....	.....
Kan.	.....	8,958	35,767	56,963	.....	.....
Neb.	.....	.....	.....	.....	.....	.....
N. D.	.....	.....	12,885	17,754	.....	.....
S. D.	.....	.....	16,946	28,773	.....	.....
Mont.	.....	.....	.....	.....	.....	.....
Wyo.	.....	.....	1,805	.....	.....	.....
Col.	.....	.....	36,289	62,852	.....	.....
Nev.	.....	.....	4,798	4,915	.....	.....
Cal.	15,300	20,210	.....	.....	.....	32,787
Ore.	.....	.....	2,586	3,445	.....	.....
Ida.	54	.....	2,350	2,625	.....	.....
U.	.....	.....	.....	3,638	.....	.....
Wash.	.....	.....	.....	13,368	.....	.....
Total	3,205,640	4,142,412	3,076,173	4,361,984	1,886,509	4,016,841

^a Besides amount distributed to local authorities. ^b Direct and collateral. ^c See introduction. ^d On commissions of executors and administrators. ^e Including oyster licenses.

TABLE A—STATE RECEIPTS

9 Poll taxes		10 Legal proceedings— taxes on suits, etc.		11 Business licenses		
1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	
.....	.....	.....	.....	.....	.....	N. Y.
.....	.....	.....	.....	.....	.....	Me.
.....	.....	.....	.....	.....	.....	N. H.
.....	.....	.....	.....	.....	.....	Vt.
.....	.....	.....	.....	.....	.....	Mass.
.....	.....	.....	.....	.....	.....	R. I.
119,692	138,731	.....	.....	.....	.....	Ct.
.....	.....	.....	.....	.....	.....	N. J.
.....	.....	152,269	155,231	329,420	654,801	Pa.
.....	.....	.....	.....	.....	.....	Del.
.....	.....	57,818	38,442	108,723	128,207	Md.
.....	.....	57,818	38,442	318,388	324,973	W. Va.
.....	.....	.....	.....	106,206	129,557	Va.
199,800	239,258	165,606	156,850	313,083	434,800	N. C.
.....	.....	.....	.....	34,090	31,107	S. C.
.....	.....	.....	.....	42,569	30,135	Ga.
.....	222,817	.....	.....	30,636	27,081	Fla.
.....	.....	.....	3,075	150,119	186,186	Miss.
.....	.....	.....	.....	.....	.....	Ala.
15,365	223,291	.....	.....	153,412	130,577	La.
.....	145,137	.....	.....	149,590	108,076	Tex.
.....	.....	93,791	87,540	443,424	511,740	Ark.
266,511	447,282	.....	.....	155,794	177,870	Tenn.
.....	.....	.....	.....	.....	.....	Ky.
.....	.....	85,727	116,038	187,216	149,003	O.
.....	.....	64,137	61,829	76,878	52,153	Ind.
.....	.....	.....	.....	.....	.....	Ill.
.....	.....	.....	.....	.....	.....	Mich.
.....	.....	.....	7,728	.....	.....	Wis.
.....	.....	.....	.....	.....	.....	Minn.
.....	.....	.....	.....	.....	.....	Ia.
.....	.....	.....	.....	.....	.....	Mo.
.....	.....	.....	.....	.....	.....	Kan.
.....	.....	.....	.....	.....	.....	Neb.
.....	.....	.....	.....	.....	.....	S. D.
.....	.....	.....	.....	.....	.....	N. D.
.....	.....	.....	.....	.....	117,785	Mont.
36,153	32,424	.....	.....	.....	.....	Wyo.
.....	.....	.....	.....	.....	.....	Col.
.....	.....	.....	.....	.....	.....	Nev.
352,927	341,116	.....	.....	.....	.....	Cal.
.....	.....	.....	.....	.....	.....	Ore.
8,295	6,722	.....	.....	7,980	10,942	Ida.
.....	.....	.....	.....	.....	.....	U.
.....	.....	.....	.....	.....	.....	Wash.
998,743	1,796,778	619,348	626,733	2,607,528	3,204,993	Total

tion under School tax. d Not passing through state treasury, but included in col. 22. For
g Chiefly on fertilizers. For phosphate royalty see Public works.

TABLE A—STATE RECEIPTS

States	12 Liquor licenses		13 Special taxes		14 Fees, fines, licenses, etc.	
	1890	1895	1890	1895	1890	1895
	\$	\$	\$	\$	\$	\$
N. Y.	.....	.....	Pool tax 22,371	112,527	131,269	118,704
Me.	<i>a</i> 4,641	<i>a</i> 4,658	.....	.....	11,575	13,790
N. H.	.....	.....	.....	.....	2,575	1,878
Vt.	.....	.....	.....	.....	42,849	62,831
Mass.	428,509	684,599	.....	.....	75,305	126,598
R. I.	104,943	106,340	Investments 121,294	56,861	46,941	64,790
Ct.	.....	.....	Munic. bonds 154,936	158,641	34,155	36,197
N. J.	.....	.....	.....	.....	36,799	45,940
Pa.	752,462	693,972	.....	.....	63,717	147,769
Del.	.....	.....	Munic. bonds 32,983	42,508	115	700
Md.	186,555	151,729	.....	.....	64,193	78,218
W. Va.	.....	.....	Inc. 49,238	44,150	17,446	17,218
Va.	240,614	303,054	.....	.....	45,941	53,536
N. C.	.....	1,300	.....	.....	6,830	11,544
S. C.	.....	<i>b</i> 51,958	.....	.....	2,434	2,517
Ga.	72,404	93,773	.....	.....	27,140	27,561
Fla.	.....	.....	.....	.....	3,696	2,457
Miss.	161,450	82,200	.....	.....	62,573	.....
Ala.	.....	.....	Lottery 40,000	.....	25,167	22,376
La.	.....	.....	.....	.....	575	975
Tex.	<i>c</i> 603,400	<i>c</i> 614,900	.....	.....	84,134	62,053
Ark.	78,600	75,558	.....	.....	10,501	12,895
Tenn.	188,398	205,431	.....	.....	1,602	2,189
Ky.	345,019	400,208	.....	.....	.....	<i>e</i> 143,387
O.	491,823	527,980	.....	.....	86,846	155,420
Ind.	.....	.....	.....	.....	8,564	11,404
Ill.	.....	.....	.....	.....	22,938	98,701
Mich.	.....	.....	.....	.....	28,295	35,939
Wis.	.....	.....	.....	.....	40,705	55,055
Minn.	.....	.....	.....	.....	<i>d</i> 109,848	<i>d</i> 161,471
Ia.	.....	.....	.....	.....	40,436	33,982
Mo.	.....	.....	.....	.....	13,575	12,940
Kan.	.....	.....	.....	.....	481	2,244
Neb.	.....	.....	.....	.....	23,307	8,750
S. D.	.....	.....	.....	.....	9,447	10,445
N. D.	.....	.....	.....	.....	9,019	8,545
Mont.	.....	.....	.....	.....	9,656	20,054
Wyo.	.....	.....	.....	.....	8,404	2,165
Col.	.....	.....	.....	.....	41,669	136,789
Nev.	.....	.....	.....	.....	1,750	1,403
Cal.	.....	.....	.....	.....	74,158	69,123
Ore.	.....	.....	.....	.....	664	1,086
Ida.	.....	.....	.....	.....	2,222	5,202
U.	.....	.....	.....	.....	2,598	28,299
Wash.	13,593	24,721	.....	.....	10,633	23,978
Total	3,672,411	4,022,381	420,832	414,687	1,342,747	1,939,118

a Income state liquor agency. *b* Net income state dispensary; gross receipts, \$802,231. *c* Courts. *d* Chiefly from grain inspection. *e* From all state institutions at Cranston. *f* Not Pennsylvania railway. *h* Phosphate royalty. *i* Fees etc. from state university and other interest on agricultural college fund. *m* Partly from redemption of investments.

TABLE A—STATE RECEIPTS

15 Prison and reformatory earnings		16 Public works, etc.		17 Public lands		
1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	
15,055	116,204	-----	-----	50,415	45,944	N. Y.
-----	-----	-----	-----	1,732	3,075	Me.
-----	-----	-----	-----	-----	-----	N. H.
14,578	28,283	-----	-----	-----	-----	Vt.
246,136	274,266	9,903	74,000	-----	-----	Mass.
39,021	39,855	-----	-----	-----	-----	R. I.
-----	-----	-----	-----	-----	-----	Ct.
56,197	52,702	18,870	18,870	j 517,232	j 68,103	N. J.
-----	-----	g 1,113,134	172,500	3,499	2,160	Pa.
-----	-----	28,625	16,255	-----	-----	Del.
-----	11,345	266,058	147,878	-----	1,409	Md.
26,138	f-----	-----	-----	241	-----	W. Va.
39,698	141,868	-----	-----	790	541	Va.
218,146	96,120	171,012	186,901	19,039	7,779	N. C.
f 77,320	f 79,272	h 237,149	h 93,308	-----	-----	S. C.
25,000	15,506	302,596	420,012	26,976	1,569	Ga.
f-----	25,000	-----	h 2,947	-----	-----	Fla.
f 47,911	f-----	-----	-----	27,486	164	Miss.
109,544	163,235	-----	-----	33,857	11,892	Ala.
23,000	39,989	-----	-----	k 254,256	27,575	La.
f 673,463	f 681,210	-----	-----	1,317,453	864,821	Tex.
27,158	32,271	-----	-----	86,066	44,735	Ark.
100,710	126,367	-----	-----	3,841	-----	Tenn.
19,933	155,052	25,998	13,979	-----	-----	Ky.
221,147	220,767	100,906	105,337	23,047	3,296	O.
173,337	147,893	-----	-----	23,425	2,389	Ind.
-----	-----	-----	25,000	-----	1,903	Ill.
f 205,585	f 220,383	-----	-----	108,229	67,431	Mich.
f-----	28,714	i 38,745	i 86,579	103,283	106,405	Wis.
15,592	209,308	i 209,634	i 95,879	643,127	957,396	Minn.
8 500	6,750	-----	-----	l 32,862	l 23,481	Ia.
193,273	173,767	-----	-----	-----	-----	Mo.
105,423	76,285	-----	-----	676,014	192,048	Kan.
-----	2,057	-----	20,267	775,452	360,102	Neb.
-----	-----	-----	-----	25,302	142,372	S. D.
-----	2,129	-----	-----	60,599	m 200,251	N. D.
-----	-----	-----	-----	-----	50,156	Mont.
-----	-----	-----	-----	-----	13,063	Wyo.
29,151	13,270	-----	-----	407,490	118,338	Col.
4,036	1,148	-----	-----	47,388	112,829	Nev.
211,552	159,583	318,262	219,940	252,592	77,083	Cal.
23,756	11,386	-----	-----	239,315	66,595	Ore.
-----	-----	-----	-----	-----	16,048	Ida.
-----	-----	-----	-----	-----	75,967	U.
4,118	33,805	-----	-----	23,812	129,083	Wash.
2,954,478	3,385,790	2,840,892	1,704,452	5,784,770	3,796,103	Total

c Certain court fees pass through state treasury which formerly went directly to support of passing through general treasury account. g Chiefly last payment of purchase money by educational institutions. j From riparian leases. k Largely from levee districts. l Partly

TABLE A.—STATE RECEIPTS

States	18 Interest on deposits		19 Refunds by localities		20 Endowment funds—net interest	
	1890	1895	1890	1895	1890	1895
N. Y.	\$ 37,209	\$ 5,436	.....	.....	\$ 362,994	\$ 344,808
Me.	632	1,854	.....	.....	.....	.....
N. H.	2,612	2,880	.....	.....	.....	.....
Vt.	3,064	2,649	.....	.....	.....	.....
Mass.	117,881	105,133	174,724	a 511,206	147,066	190,493
R. I.	3,561	4,086	.....	.....	11,274	9,105
Co.	29,243	35,260	.....	.....	125,021	134,309
N. J.	.....	.....	.....	.....	113,507	133,290
Pa.	.....	.....	.....	.....	.....	.....
Del.	.....	.....	.....	.....	19,991	21,771
Md.	16,888	16,208	.....	18,825	27,651	24,108
W. Va.	4,981	11,820	.....	.....	31,912	43,076
Va.	7,106	9,561	.....	.....	.....	.....
N. C.	.....	531	.....	.....	.....	.....
S. C.	.....	.....	.....	.....	.....	.....
Ga.	.....	6,084	.....	.....	.....	.....
Fla.	.....	3,246	.....	.....	.....	.....
Miss.	.....	.....	.....	.....	.....	.....
Ala.	.....	.....	.....	.....	.....	.....
La.	.....	.....	.....	.....	.....	.....
Tex.	.....	.....	.....	.....	260,590	269,172
Ark.	.....	.....	.....	.....	.....	.....
Tenn.	.....	.....	.....	.....	.....	.....
Ky.	.....	.....	.....	.....	.....	.....
O.	.....	.....	.....	.....	.....	.....
Ind.	.....	.....	51,011	66,217	572,317	802,258
Ill.	.....	.....	.....	.....	.....	.....
Mich.	33,964	15,007	.....	.....	.....	.....
Wis.	.....	9,686	137,337	266,690	105,534	156,344
Minn.	15,594	47,376	.....	.....	106,322	191,547
Ia.	.....	.....	298,868	361,081	243,208	234,094
Mo.	14,372	9,875	.....	.....	.....	.....
Kan.	.....	.....	.....	.....	289,231	340,420
Neb.	.....	3,759	71,911	.....	215,855	306,708
S. D.	.....	.....	.....	73,988	.....	34,855
N. D.	.....	.....	.....	.....	.....	17,781
Mont.	.....	.....	.....	.....	.....	.....
Wyo.	.....	.....	.....	.....	.....	.....
Col.	.....	16,483	.....	.....	.....	.....
Nev.	.....	.....	23,320	.....	15,000	24,000
Cal.	.....	.....	19,472	75,946	161,861	130,346
Ore.	.....	.....	.....	.....	155,842	135,011
Ida.	.....	.....	.....	.....	691	9,128
U.	.....	.....	.....	.....	.....	.....
Wash.	.....	.....	.....	.....	.....	26,884
Total	287,107	306,934	776,643	1,373,953	2,965,867	3,579,508

a Largely refunded interest on bonds issued in aid of Metropolitan districts. b Largely sale of securities. c Chiefly from direct tax refund. f Chiefly sales of school books. g Be-

TABLE A—STATE RECEIPTS

21 Miscellaneous		22 Total receipts ^a		
1890	1895	1890	1895	
\$	\$	\$	\$	
114,295	b 1,007,416	14,713,889	14,818,909	N. Y.
4,995	5,954	1,140,169	1,418,443	Me.
171	24,864	702,164	773,544	N. H.
11,798	38,822	530,637	788,260	Vt.
31,125	38,482	5,930,137	7,189,489	Mass.
2,667	20,484	1,075,963	1,340,442	R. I.
25,608	73,178	2,254,632	2,252,325	Ct.
36,641	57,414	4,407,951	4,516,019	N. J.
c 245,210	c 196,984	8,625,919	11,455,010	Pa.
16,933	22,157	253,159	287,790	Del.
1,480	380	2,117,152	2,217,346	Md.
2,316	e 156,817	981,733	1,183,868	W. Va.
d 219,962	25,389	2,887,527	3,333,257	Va.
2,749	61,335	1,204,127	1,287,178	N. C.
18,453	28,761	1,134,440	1,150,890	S. C.
79,805	6,056	2,146,694	2,712,657	Ga.
554	4,028	760,128	681,375	Fla.
67,384	27,540	1,362,177	1,500,333	Miss.
52,378	39,054	1,539,493	1,538,648	Ala.
13,326	54,448	2,601,769	3,148,220	La.
24,358	21,740	4,986,530	5,222,215	Tex.
6,931	8,523	678,459	928,197	Ark.
4,144	23,891	1,592,751	1,958,198	Tenn.
69,302	42,447	3,395,760	3,691,718	Ky.
53,194	96,501	5,773,677	6,035,155	O.
23,707	279,119	3,497,019	6,144,298	Ind.
56,349	252,403	3,753,492	4,377,589	Ill.
4,716	76,539	3,152,650	3,444,022	Mich.
36,951	62,318	2,409,592	2,274,049	Wis.
50,931	87,112	3,263,981	4,443,143	Minn.
29,241	50,569	2,028,696	1,998,492	Ia.
16,043	15,080	3,393,514	3,415,670	Mo.
7,705	38,247	2,113,893	2,019,368	Kan.
20,271	46,642	1,779,494	1,600,648	Neb.
7,567	15,359	375,248	459,364	S. D.
29,364	20,533	281,459	742,702	N. D.
24,403	26,788	309,429	510,561	Mont.
674	1,935	193,825	184,490	Wyo.
18,873	37,123	1,172,376	1,206,878	Col.
1,234	1,204	288,614	318,705	Nev.
f 80,797	f 94,346	8,814,744	7,328,950	Cal.
19,288	18,618	738,557	1,043,833	Ore.
2,408	27,143	102,306	212,771	Ida.
76,339	27,403	333,688	789,191	U.
2,945	15,125	g 345,389	681,710	Wash.
1,615,585	3,276,271	111,195,003	124,925,920	Total

transfer of 'college fund' capital. c Including interest on sinking fund. d Chiefly from sales \$100,000 bonds issued for revenue deficiencies. ^a See specially Introduction.

TABLE B—STATE EXPENDITURES

States	23 Legislature ^a		24 Executive		25 Secretary of state		26 Attorney
	1890	1895	1890	1895	1890	1895	1890
	\$	\$	\$	\$	\$	\$	\$
N. Y.	421,036	625,588	35,574	35,248	33,855	47,466	61,439
Me.	<i>241,510</i>	58,998	13,905	14,364	5,223	6,650	1,062
N. H.	82,963	99,992	6,011	6,525	5,013	4,920	-----
Vt.	<i>56,140</i>	72,690	3,200	3,054	1,700	3,948	5,350
Mass.	290,610	317,617	23,965	35,757	28,108	53,963	11,677
R. I.	29,703	26,726	5,094	6,503	5,320	6,102	5,026
Ct.	<i>119,994</i>	161,840	8,045	8,564	7,294	6,772	-----
N. J.	88,489	110,372	10,615	15,000	13,000	13,000	8,500
Pa.	<i>617,496</i>	620,233	25,199	29,056	40,678	54,163	18,639
Del.	<i>18,986</i>	20,046	2,000	2,000	1,000	2,600	1,500
Md.	111,516	<i>149,509</i>	13,000	17,600	2,000	3,000	693
W. Va.	29,932	40,358	3,700	4,625	4,588	5,160	2,676
Va.	81,094	<i>87,094</i>	6,200	6,417	4,500	5,846	4,237
N. C.	59,951	72,984	5,800	4,800	4,000	4,000	-----
S. C.	41,890	33,120	10,596	8,472	5,002	4,845	4,108
Ga.	153,620	67,587	9,475	8,950	2,500	3,000	2,000
Fla.	<i>67,255</i>	70,000	5,420	6,608	1,500	2,000	1,500
Miss.	76,713	<i>45,868</i>	8,820	8,320	3,500	3,500	-----
Ala.	<i>49,489</i>	50,663	6,299	6,605	3,300	2,975	1,375
La.	64,000	<i>66,500</i>	9,200	9,954	5,520	5,195	5,310
Tex.	<i>104,067</i>	122,961	16,206	17,221	9,106	9,299	12,968
Ark.	<i>94,384</i>	100,070	6,751	6,781	6,144	5,936	2,624
Tenn.	<i>b 29,251</i>	<i>84,827</i>	4,728	5,254	1,918	5,011	3,000
Ky.	195,447	<i>198,532</i>	7,867	5,676	2,225	5,880	3,468
O.	138,704	87,202	16,188	16,146	23,632	28,487	7,587
Ind.	<i>124,806</i>	99,723	9,174	10,778	5,225	6,999	6,852
Ill.	<i>240,913</i>	375,257	24,452	17,829	21,335	31,647	9,412
Mich.	<i>145,368</i>	130,565	7,600	8,198	36,875	95,034	2,892
Wis.	<i>169,139</i>	127,934	11,710	13,318	<i>e 27,710</i>	<i>e 33,008</i>	5,081
Minn.	<i>149,777</i>	143,028	11,934	15,372	7,300	9,800	9,400
Ia.	<i>127,766</i>	<i>178,201</i>	12,301	12,406	9,662	10,594	5,634
Mo.	<i>133,812</i>	214,055	8,907	10,222	14,340	19,802	5,475
Kan.	<i>67,525</i>	86,587	12,387	19,400	9,000	11,627	7,521
Neb.	<i>171,772</i>	108,340	9,011	15,586	9,031	8,768	5,750
S. D.	83,891	55,964	3,925	4,785	4,353	5,160	1,835
N. D.	80,765	58,263	5,160	6,998	4,364	5,755	2,905
Mont.	<i>o 22,169</i>	55,756	7,943	8,006	3,875	6,774	3,660
Wyo.	-----	21,368	1,078	5,875	1,000	4,214	1,499
Col.	<i>159,025</i>	65,694	7,500	7,500	8,000	15,500	6,178
Nev.	<i>49,553</i>	30,631	8,295	5,232	5,000	3,600	3,000
Cal.	<i>183,823</i>	196,512	18,362	26,228	13,919	16,811	15,331
Ore.	<i>41,993</i>	<i>54,901</i>	2,700	3,300	<i>e 5,100</i>	<i>e 8,353</i>	-----
Ida.	<i>40,785</i>	36,003	147	4,950	-----	4,860	2,194
U.	12,879	40,000	2,250	3,578	-----	5,696	-----
Wash.	147,958	67,008	6,971	8,130	6,914	7,253	2,239
Total	5,422,359	5,441,167	435,665	497,191	413,629	604,973	261,597

^a Figures in italics are for session of preceding or following year. ^b Extra session. ^c Be-charge of insurance or bank department. ^e Secretary of state acts as auditor. ^f Including rail-
^d Inseparable from contingent miscellaneous expenses. ^j Including large item for constitu-

TABLE B—STATE EXPENDITURES

general	27 Treasurer d		28 Auditor or comptroller d		29 Public printing		
1895	1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	\$	
44,003	23,921	29,277	49,417	139,439	160,712	j 483,859	N. Y.
1,447	6,100	6,300	-----	-----	39,183	64,336	Me.
-----	4,837	4,893	-----	-----	28,564	38,323	N. H.
12,376	1,700	1,976	2,000	2,681	7,830	19,085	Vt.
6,188	19,876	24,302	10,179	16,290	139,497	182,295	Mass.
-----	3,632	3,700	4,784	5,100	24,998	52,428	R. I.
6,000	7,171	20,097	4,995	8,718	53,651	50,089	Ct.
22,200	10,300	10,200	10,800	12,000	181,668	222,461	N. J.
	18,199	23,545	28,685	36,531	233,669	283,163	Pa.
2,600	933	1,950	1,200	1,200	3,604	5,781	Del.
1,278	9,070	9,183	9,895	12,648	39,191	36,766	Md.
2,771	3,149	4,311	10,791	10,871	38,910	38,188	W. Va.
4,131	6,508	6,580	21,799	24,188	26,253	27,396	Va.
-----	6,060	6,250	3,500	3,499	18,640	20,677	N. C.
5,490	6,906	6,500	7,044	5,294	24,202	20,684	S. C.
2,475	3,922	4,060	5,750	5,400	28,662	27,487	Ga.
2,000	4,400	1,500	5,700	1,500	12,298	9,121	Fla.
-----	4,750	4,750	7,750	7,750	20,856	7,336	Miss.
3,812	5,100	5,200	6,450	7,195	6,715	12,448	Ala.
6,500	5,360	5,360	8,270	11,958	83,390	24,160	La.
12,681	18,750	24,598	f 49,973	63,484	47,091	26,964	Tex.
2,981	8,070	1,380	8,262	9,430	32,710	22,330	Ark.
2,500	4,933	5,654	7,132	8,767	5,443	3,247	Tenn.
6,040	4,877	3,625	8,341	19,942	78,359	37,717	Ky.
5,140	13,419	13,277	14,626	15,798	193,808	73,073	O.
34,667	5,506	6,580	6,800	10,800	33,108	47,351	Ind.
18,357	12,560	16,413	14,648	16,088	56,083	99,077	Ill.
5,082	7,688	7,603	16,126	21,151	73,263	73,684	Mich.
5,277	20,101	23,425	e -----	e -----	37,975	118,035	Wis.
9,261	6,840	8,530	10,930	15,082	42,380	110,406	Minn.
6,171	5,890	5,685	10,362	10,337	52,098	49,595	Ia.
7,506	g 11,185	g 12,651	g 10,993	g 12,651	36,673	57,741	Mo.
7,467	11,451	10,233	9,850	10,300	89,126	129,783	Kan.
5,439	7,975	10,798	12,238	17,698	11,625	7,044	Neb.
5,500	3,436	4,133	4,996	5,400	8,841	3,302	S. D.
3,728	4,191	4,206	5,266	5,461	16,927	27,415	N. D.
7,486	3,382	4,897	4,019	5,756	h 0,524	27,643	Mont.
2,445	2,225	3,471	1,696	3,927	i -----	7,809	Wyo.
3,000	6,250	11,500	5,200	9,000	46,227	29,002	Col.
2,000	4,962	3,600	5,012	3,628	9,135	15,635	Nev.
23,814	11,308	11,724	16,523	16,984	136,877	227,638	Cal.
5,575	2,300	2,800	e -----	e -----	23,811	45,485	Ore.
3,525	1,100	2,631	2,806	4,830	i -----	3,508	Ida.
3,892	2,250	1,547	7,249	2,906	2,642	5,791	U.
6,851	2,754	4,382	4,482	8,102	24,068	27,462	Wash.
319,656	335,287	385,279	436,539	609,724	2,237,287	2,899,490	Total

sides \$42,366 covered by certificates of indebtedness. d Auditor and treasurer often have way department. g One half joint expense. h Covered by certificates of indebtedness. i National convention printing.

TABLE B—STATE EXPENDITURES

States	80 Judiciary		81 Militia — national guard		82 Public schools	
	1890	1895	1890	1895	1890	1895
N. Y.	\$ 562,000	\$ 599,444	\$ 607,320	\$ 852,728	\$ 3,952,142	\$ 4,493,589
Me.	44,570	48,861	22,402	38,106	424,845	567,151
N. H.	39,456	43,054	27,984	32,809	62,109	84,780
Vt.	95,141	126,746	32,981	25,448	20,911	92,513
Mass.	239,409	307,325	239,125	219,517	106,215	161,896
R. I.	129,125	177,970	58,327	229,358	130,387	130,719
Ct.	301,329	369,362	114,383	208,377	387,678	434,170
N. J.	151,501	175,360	150,557	404,825	2,065,773	2,247,726
Pa.	524,834	610,526	246,223	399,198	2,121,600	5,900,452
Del.	17,000	20,305	6,325	5,600	112,850	123,584
Md.	97,319	133,029	41,240	48,776	688,757	688,907
W. Va.	121,579	144,420	1,440	31,125	312,749	375,521
Va.	347,749	444,216	13,025	40,378	833,780	964,234
N. C.	53,104	63,070	14,863	13,754	3,964	7,170
S. C.	68,436	64,075	18,500	27,298	4,007	3,600
Ga.	69,932	91,976	7,180	16,089	495,137	1,216,843
Fla.	229,700	154,297	4,666	10,929	119,058	167,189
Miss.	68,471	71,023	-----	-----	349,142	974,854
Ala.	114,332	135,925	20,876	26,407	597,730	527,920
La.	825,263	292,256	14,827	17,052	213,431	221,901
Tex.	566,402	852,093	43,149	45,545	2,295,407	2,578,522
Ark.	62,453	74,907	-----	-----	290,434	839,365
Tenn.	296,063	377,646	3,012	12,148	139,900	148,330
Ky.	680,462	768,799	25,431	14,955	1,492,345	2,028,496
O.	435,607	470,021	138,027	154,622	1,981,997	1,970,154
Ind.	209,996	207,031	31,924	115,885	2,095,797	3,043,913
Ill.	319,432	350,571	105,173	367,573	1,066,330	1,067,622
Mich.	131,934	172,465	72,130	104,200	823,553	895,126
Wis.	101,926	116,349	73,999	102,513	786,156	871,426
Minn.	142,004	153,000	41,218	60,452	847,782	1,168,395
Ia.	147,332	139,479	41,320	43,646	262,535	243,321
Mo.	409,381	638,036	4,085	16,172	867,080	883,914
Kan.	119,437	118,588	15,776	15,236	531,573	461,713
Neb.	109,580	156,872	16,764	16,004	520,875	484,630
S. D.	27,088	26,910	3,062	3,238	6,836	147,184
N. D.	31,692	42,317	2,468	12,561	5,026	385,961
Mont.	36,599	81,609	3,075	23,764	2,822	6,268
Wyo.	4,305	24,249	-----	3,604	-----	2,921
Col.	115,046	127,976	35,213	33,132	129,757	89,905
Nev.	46,144	33,160	243	2,135	62,246	109,787
Cal.	266,612	290,564	176,523	350,969	2,775,578	2,915,887
Ore.	45,893	58,923	17,995	32,042	148,442	150,327
Ida.	16,966	51,212	90	822	1,613	16,253
U.	84,699	80,278	-----	3,220	139,991	31,641
Wash.	83,993	92,700	18,102	37,259	4,569	190,349
Total	8,091,296	9,578,995	2,511,023	4,219,461	30,280,909	39,606,165

a Including large expense for armories. b University of the State of New York grouped Normal and Industrial school. f Normal schools partly included with Public schools. g See f including mining school.

TABLE B—STATE EXPENDITURES

33 Normal schools		34 State university and higher education		35 Agricultural and industrial education		
1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	
160,171	179,986	<i>g</i> 19,326	<i>g</i> 29,486	-----	-----	N. Y.
22,098	52,592	4,440	16,340	10,000	20,000	Me.
7,226	13,269	-----	7,500	8,000	3,849	N. H.
9,648	17,052	9,866	4,800	8,130	34,130	Vt.
<i>d</i> 282,837	<i>d</i> 338,901	-----	<i>h</i> 50,864	95,422	127,624	Mass.
15,102	<i>d</i> 218,515	-----	-----	<i>d</i> 48,389	<i>d</i> 51,537	R. I.
34,780	<i>d</i> 108,801	-----	-----	56,315	30,591	Ct.
21,764	44,391	-----	-----	25,990	67,320	N. J.
240,782	236,393	98,310	<i>h</i> 200,516	-----	-----	Pa.
-----	-----	-----	-----	19,980	25,980	Del.
12,500	42,736	22,500	24,900	26,696	44,398	Md.
20,470	<i>e</i> 42,423	36,912	14,200	-----	7,467	W. Va.
9,000	32,185	<i>h</i> 226,544	<i>h</i> 238,831	21,820	28,500	Va.
11,236	29,056	20,000	22,500	7,500	69,750	N. C.
5,320	70,510	<i>h</i> 72,900	<i>h</i> 57,183	25,000	85,597	S. C.
-----	24,002	27,765	36,696	18,000	22,500	Ga.
16,215	8,614	21,435	13,007	10,800	2,500	Fla.
3,931	3,398	32,643	24,133	69,367	71,962	Miss.
36,000	31,000	33,579	28,608	<i>d</i> 61,495	39,098	Ala.
9,270	15,250	23,990	28,740	9,115	16,615	La.
5,369	45,917	90,914	106,903	37,932	43,333	Tex.
5,059	12,757	-----	-----	19,500	19,975	Ark.
165	17,971	-----	38,020	-----	-----	Tenn.
4,234	5,900	-----	-----	60,176	80,596	Ky.
-----	-----	137,476	172,609	-----	-----	O.
<i>f</i> 10,256	50,222	47,274	111,840	53,000	128,500	Ind.
56,022	121,032	39,294	244,900	-----	-----	Ill.
60,184	54,847	<i>j</i> 300,672	<i>j</i> 281,434	58,520	60,164	Mich.
150,070	155,385	<i>i</i> 187,048	<i>i</i> 298,957	-----	-----	Wis.
87,286	154,589	<i>d i</i> 333,052	<i>i</i> 358,097	20,339	32,739	Minn.
25,318	39,969	75,919	79,584	19,729	41,883	Ia.
37,596	79,701	51,949	<i>j</i> 238,244	7,339	24,437	Mo.
26,523	31,962	79,825	147,116	41,719	55,590	Kan.
24,908	23,563	104,539	164,120	-----	-----	Neb.
30,364	26,027	<i>j</i> 41,381	<i>j</i> 28,808	24,463	6,835	S. D.
1,785	22,324	25,361	22,144	-----	19,032	N. D.
-----	-----	-----	8,962	-----	2,414	Mont.
-----	-----	14,278	3,692	-----	-----	Wyo.
6,050	41,816	<i>j</i> 75,682	<i>j</i> 100,789	42,845	59,796	Col.
-----	-----	26,151	47,990	-----	-----	Nev.
107,808	171,196	173,940	187,615	-----	-----	Cal.
-----	23,191	17,757	41,578	39,775	21,619	Ore.
-----	-----	9,488	23,774	-----	21,500	Ida.
-----	-----	52,725	53,500	10,000	45,500	U.
-----	33,973	6,392	124,978	847	44,006	Wash.
1,557,347	2,621,416	2,541,327	3,683,958	953,203	1,467,247	Total

with schools. *c* Besides \$56,345 about to be distributed. *d* Largely buildings constructed. *e* Schools. *f* Including military and nautical schools. *g* Gross expenditures of institution.

TABLE B — STATE EXPENDITURES

States	36 State Library		37 Local Libraries		38 Prisons	
	1890	1895	1890	1895	1890	1895
N. Y.	\$ 28,154	\$ 47,117	-----	\$ 32,541	\$ 872,524	\$ 781,360
Me.	2,570	6,818	-----	2,710	15,692	40,028
N. H.	4,085	6,144	-----	2,572	6,012	18,973
Vt.	1,732	1,601	-----	55	15,450	22,243
Mass.	11,304	14,368	-----	1,636	329,121	350,480
R. I.	2,861	8,684	4,311	5,653	72,266	92,777
Ct.	3,600	3,032	-----	-----	132,854	153,886
N. J.	6,165	5,660	^a 2,750	^a 4,730	161,312	226,399
Pa.	15,183	19,575	-----	-----	101,940	126,730
Del.	625	1,225	-----	-----	-----	-----
Md.	5,603	7,460	-----	-----	20,000	50,000
W. Va.	1,194	3,124	-----	-----	40,319	11,650
Va.	150	242	-----	-----	34,985	130,828
N. C.	1,757	1,600	-----	-----	257,635	148,551
S. C.	955	1,417	-----	-----	86,389	99,360
Ga.	6,617	5,830	-----	-----	7,010	10,754
Fla.	-----	-----	-----	-----	325	10,045
Miss.	1,632	1,753	-----	-----	28,419	85,962
Ala.	-----	-----	-----	-----	111,159	256,285
La.	1,500	1,750	-----	-----	-----	-----
Tex.	-----	-----	-----	-----	689,962	694,220
Ark.	-----	-----	-----	-----	1,670	50,430
Tenn.	2,278	1,804	-----	-----	7,289	13,708
Ky.	5,799	2,063	636	-----	132,137	222,625
O.	11,254	13,967	-----	-----	311,091	353,392
Ind.	6,265	5,595	-----	-----	185,595	190,484
Ill.	2,647	2,414	-----	-----	133,203	210,243
Mich.	7,708	8,372	-----	^b 2,000	^c 344,157	^c 349,281
Wis.	4,909	4,061	-----	-----	8,007	87,401
Minn.	4,387	5,708	7,713	6,901	134,612	227,967
Ia.	6,417	8,190	-----	-----	94,866	149,801
Mo.	2,268	4,300	-----	-----	237,026	238,842
Kan.	3,100	3,900	-----	-----	156,087	161,034
Neb.	8,525	8,596	-----	-----	71,517	81,431
S. D.	-----	-----	-----	-----	30,262	35,485
N. D.	3,691	1,680	-----	-----	30,897	33,867
Mont.	2,667	3,558	-----	-----	^d 14,795	64,189
Wyo.	2,333	1,444	-----	-----	13,131	^e 42,780
Col.	1,000	1,500	-----	-----	138,293	99,483
Nev.	644	1,884	-----	-----	41,942	30,846
Cal.	52,498	24,302	-----	-----	593,264	524,473
Ore.	2,523	3,551	-----	-----	46,314	^f 101,421
Ida.	760	1,843	-----	-----	21,653	32,596
U.	500	5,746	-----	-----	-----	30,116
Wash.	981	4,208	-----	-----	66,773	140,535
Total	228,841	256,086	15,410	58,798	5,797,955	6,782,961

^a School libraries. ^b Traveling libraries. ^c Prisons known as 'penitentiary and house of board of charities and reform, blind, deaf, hospitals. ^f Largely construction of buildings. of indebtedness.

TABLE B—STATE EXPENDITURES

39 Reformatories		40 Boards of charities and reform		41 Insane		
1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	
496,000	904,855	10,553	18,376	1,067,617	2,516,572	N. Y.
26,080	30,171	-----	-----	<i>f</i> 117,152	134,112	Me.
-----	6,000	-----	-----	18,223	41,684	N. H.
21,274	38,231	-----	-----	88,569	136,534	Vt.
445,754	600,472	8,859	16,222	228,615	264,803	Mass.
41,218	66,547	4,458	6,110	77,801	86,675	R. I.
98,358	113,160	2,290	2,858	84,031	104,100	Ct.
71,460	96,699	-----	-----	233,597	329,845	N. J.
147,216	240,260	11,800	14,925	408,650	648,462	Pa.
-----	1,000	-----	-----	14,000	32,367	Del.
55,673	53,040	-----	-----	29,195	58,431	Md.
10,820	21,610	-----	-----	133,490	219,860	W. Va.
-----	-----	-----	-----	343,764	337,869	Va.
-----	-----	50	859	192,300	227,269	N. C.
-----	-----	-----	-----	110,444	110,033	S. C.
-----	-----	-----	-----	197,157	<i>f</i> 166,529	Ga.
-----	-----	-----	-----	42,429	67,039	Fla.
-----	-----	-----	-----	102,560	91,198	Miss.
-----	-----	-----	-----	115,303	117,796	Ala.
-----	-----	-----	-----	86,000	100,000	La.
10,498	33,910	-----	-----	313,803	317,348	Tex.
-----	-----	-----	-----	78,843	99,171	Ark.
3,160	35,545	-----	-----	206,505	172,219	Tenn.
-----	-----	-----	-----	325,970	268,590	Ky.
151,522	212,877	3,391	4,745	893,232	973,004	O.
127,784	110,000	3,989	5,000	612,330	611,958	Ind.
53,886	268,364	7,077	5,100	684,635	1,013,722	Ill.
140,600	121,446	4,534	4,178	464,028	597,780	Mich.
39,429	91,661	20,787	18,076	423,564	553,193	Wis.
<i>f</i> 180,193	106,778	-----	6,000	431,584	697,073	Minn.
66,857	71,578	-----	-----	399,691	467,453	Ia.
11,845	63,586	-----	-----	141,310	111,385	Mo.
96,105	59,423	-----	6,498	203,206	366,979	Kan.
113,228	89,491	-----	-----	234,232	165,785	Neb.
14,157	17,637	2,121	2,000	68,809	81,573	S. D.
-----	3,558	-----	-----	61,806	76,202	N. D.
-----	32,004	-----	-----	<i>h</i> 6,306	103,587	Mont.
1,706	-----	-----	-----	-----	10,405	Wyo.
39,754	65,812	-----	2,872	67,892	53,459	Col.
-----	-----	-----	-----	38,044	33,093	Nev.
105,082	274,722	-----	-----	882,680	726,168	Cal.
17,500	<i>f</i> 63,879	-----	-----	140,245	<i>f</i> 208,459	Ore.
-----	-----	-----	-----	33,585	36,410	Ida.
38,000	18,657	-----	-----	48,200	38,726	U.
11,856	26,071	-----	-----	144,834	152,132	Wash.
2,636,965	3,939,044	79,909	113,819	10,596,231	13,727,052	Total

correction. *d* Also \$44,903 covered by certificates of indebtedness. *e* Including prisons. *g* State now bears entire expense, formerly shared by counties. *h* Besides \$77,381 certificates

TABLE B—STATE EXPENDITURES

States	43 Feeble-minded (idiots, epileptics, etc.)		43 Blind		44 Deaf and dumb	
	1890	1895	1890	1895	1890	1895
	\$	\$	\$	\$	\$	\$
N. Y.	166,485	<i>a</i> 350,942	90,127	82,600	217,170	216,438
Me.	2,934	2,926	<i>c</i> 9,336	17,333	<i>c</i> 9,336	17,334
N. H.	-----	900	3,387	2,725	4,226	3,896
Vt.	-----	2,880	2,825	2,100	2,997	3,881
Mass.	<i>a</i> 147,521	33,323	30,000	30,000	34,751	44,744
R. I.	-----	3,428	-----	5,666	4,929	21,141
Ct.	13,141	15,263	6,000	18,545	11,295	5,824
N. J.	44,535	80,114	9,876	13,818	38,212	55,139
Pa.	108,424	<i>a</i> 357,622	69,562	52,813	168,570	230,474
Del.	-----	100	602	-----	2,000	3,976
Md.	5,000	13,000	15,000	21,000	<i>c</i> 32,000	32,000
W. Va.	-----	-----	<i>c</i> 12,850	15,100	<i>c</i> 12,850	15,100
Va.	-----	-----	<i>c</i> 17,525	18,750	<i>c</i> 17,525	18,750
N. C.	-----	-----	<i>c</i> 21,620	54,055	<i>c</i> 21,620	54,055
S. C.	-----	-----	<i>c</i> 7,262	8,500	<i>c</i> 7,262	8,500
Ga.	-----	-----	20,000	19,000	17,000	19,750
Fla.	-----	-----	<i>c</i> 5,702	5,044	<i>c</i> 5,702	5,044
Miss.	-----	-----	8,224	7,956	19,237	16,186
Ala.	-----	-----	18,100	26,277	18,128	25,271
La.	-----	-----	6,929	10,750	17,648	18,400
Tex.	-----	-----	41,936	43,484	55,417	65,309
Ark.	-----	-----	36,705	27,773	28,505	38,773
Tenn.	-----	-----	18,850	20,575	33,750	37,000
Ky.	131,996	102,016	30,364	13,730	37,010	37,684
O.	149,349	290,939	65,665	73,416	92,313	100,343
Ind.	<i>a</i> 186,464	99,648	58,348	33,738	101,333	70,337
Ill.	84,565	89,573	52,248	81,315	111,965	124,891
Mich.	-----	40,558	20,159	26,297	65,380	57,432
Wis.	-----	-----	23,388	30,979	38,211	51,423
Minn.	<i>b</i> 41,762	90,112	<i>b</i> 41,762	20,546	<i>b</i> 41,762	58,778
Ia.	93,633	109,759	39,583	48,872	72,288	69,732
Mo.	-----	-----	30,681	30,107	80,008	60,899
Kan.	26,439	21,859	17,158	17,379	37,231	41,443
Neb.	35,417	35,914	20,817	29,844	34,252	36,719
S. D.	-----	-----	461	656	15,917	12,470
N. D.	-----	-----	-----	-----	45	9,062
Mont.	600	-----	150	-----	3,241	6,120
Wyo.	-----	-----	-----	<i>d</i> -----	-----	<i>d</i> -----
Col.	-----	-----	<i>a c</i> 35,845	22,761	<i>c</i> 35,845	22,761
Nev.	-----	12,091	206	814	207	815
Cal.	94,772	100,743	<i>c</i> 90,773	60,162	<i>c</i> 90,773	60,162
Ore.	-----	-----	4,371	<i>a</i> 12,695	8,879	<i>a</i> 22,443
Ida.	-----	-----	-----	1,442	-----	1,442
U.	-----	-----	<i>c</i> 9,000	10,525	<i>c</i> 9,000	10,525
Wash.	-----	21,099	<i>c</i> 13,997	150	<i>c</i> 13,997	150
Total	1,333,037	1,874,809	1,007,394	1,019,292	1,669,787	1,812,606

a Largely buildings. *b* One third institution for defective youth. *c* Joint institution for including hospital cottages at Baldwinville. *d* Chiefly soldiers' orphans' homes. *A* Relief

TABLE B—STATE EXPENDITURES

45 Hospitals (sick and wounded)		46 Orphans		47 Poor relief		
1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	
5,000	23,100	11,000	24,651	42,114	36,622	N. Y.
		9,900	13,900	16,278	23,380	Me.
			169			N. H.
<i>e</i> 47,267	<i>e</i> 52,021	<i>f</i> 130,786	<i>f</i> 115,517	301,148	408,463	Vt.
		21,877	27,704	<i>a</i> 109,660	43,972	Mass.
23,000	38,500	24,465	56,215	5,539	16,550	R. I.
						Ct.
342,665	556,810	<i>g</i> 185,869	<i>g</i> 277,037	24,625	30,378	N. J.
						Pa.
14,250	33,000	19,000	24,500	5,500	6,500	Del.
	1,617					Md.
		10,000	12,625			W. Va.
						Va.
						N. C.
						S. C.
						Ga.
						Fla.
15,000	13,610					Miss.
67,900	100,367					Ala.
		13,931	20,101			La.
						Tex.
						Ark.
						Tenn.
						Ky.
		<i>g</i> 199,453	<i>g</i> 181,969			O.
		<i>g</i> 110,962	<i>g</i> 107,200			Ind.
28,532	31,228	<i>g</i> 87,105	<i>g</i> 62,831			Ill.
		42,821	47,113			Mich.
		42,371	47,036		<i>h</i> 4,061	Wis.
		6,924	61,997		<i>h</i> 45,000	Minn.
		55,059	54,454	2,942	3,019	Ia.
						Mo.
	4,500	<i>g</i> 16,666	<i>g</i> 25,712		<i>h</i> 76,374	Kan.
				14,061	<i>h</i> 141,675	Neb.
						S. D.
			9,755	<i>h</i> 1,607		N. D.
	9,540					Mont.
			4,455			Wyo.
						Col.
		13,537	16,962			Nev.
		250,517	352,923	214,566	543,921	Cal.
		3,000	13,750	4,394	4,098	Ore.
		5,500				Ida.
						U.
						Wash.
543,614	864,993	1,260,743	1,548,576	742,434	1,384,513	Total

deaf and blind, 1890 and 1895. *d* See under Prisons. *e* Including hospital for inebriates of drought and fire sufferers.

TABLE B—STATE EXPENDITURES

States	48 Soldiers' homes		49 Soldiers' relief— pensions, burial, etc.		Soldiers' monuments (incl'g state mem'l's)		51 Taxa- ment, col-
	1890	1895	1890	1895	1890	1895	1890
	\$	\$	\$	\$	\$	\$	\$
N. Y.	186,310	174,565	6,000	-----	31,000	24,495	8,999
Me.	-----	-----	70,758	70,184	13,126	250	12,175
N. H.	258	14,508	-----	3,000	266	8,047	963
Vt.	10,000	7,000	210	-----	-----	-----	918
Mass.	56,145	54,903	421,125	633,411	-----	14,693	25,624
R. I.	74,438	25,403	25,028	14,130	1,452	345	4,200
Ct.	136,086	77,800	19,611	8,937	18,284	11,684	-----
N. J.	84,621	53,814	4,128	4,801	3,153	10,262	27,073
Pa.	81,150	102,984	-----	-----	87,631	98,276	44,741
Del.	-----	-----	750	925	-----	-----	-----
Md.	5,000	7,500	-----	3,000	-----	-----	4,500
W. Va.	-----	-----	-----	-----	-----	-----	1,308
Va.	11,410	30,000	116,190	110,347	-----	-----	112,193
N. C.	-----	8,500	33,852	105,096	-----	-----	969
S. C.	-----	-----	49,994	51,745	-----	55	25,607
Ga.	-----	-----	186,610	426,380	-----	-----	5,500
Fla.	-----	-----	29,882	55,087	-----	300	39,365
Miss.	-----	-----	20,658	71,632	6,500	-----	21,954
Ala.	-----	-----	49,608	120,366	-----	-----	1,787
La.	6,950	12,000	3,825	635	-----	-----	141,253
Tex.	-----	28,855	70,875	56,462	-----	-----	-----
Ark.	-----	5,953	-----	43,658	-----	-----	26,060
Tenn.	2,000	9,375	11,344	56,569	-----	408	-----
Ky.	-----	-----	837	-----	-----	-----	128,912
O.	197,441	171,419	-----	-----	-----	67,238	-----
Ind.	-----	36,642	-----	-----	35,333	50,191	1,000
Ill.	148,881	169,447	-----	-----	26,622	16,062	9,790
Mich.	62,098	88,908	6,530	4,783	4,110	1,600	84,033
Wis.	16,476	79,484	16,147	743	-----	2,928	1,605
Minn.	78,997	66,000	55,811	35,506	458	2,586	1,564
Ia.	65,847	72,328	-----	-----	450	41,771	-----
Mo.	-----	-----	-----	-----	-----	5,336	159,167
Kan.	5,000	31,423	-----	-----	17,998	401	-----
Neb.	47,482	47,940	-----	-----	-----	-----	64,682
S. D.	38,973	26,630	646	811	-----	-----	1,075
N. D.	-----	8,212	98	420	-----	-----	455
Mont.	-----	1,000	-----	-----	-----	-----	23
Wyo.	-----	2,859	-----	-----	-----	-----	1,164
Col.	-----	40,550	500	-----	-----	-----	-----
Nev.	-----	-----	-----	-----	-----	-----	-----
Cal.	37,516	11,250	-----	2,436	-----	1,168	18,643
Ore.	-----	14,598	-----	76	-----	-----	-----
Ida.	-----	14,500	-----	-----	-----	-----	-----
U.	-----	-----	-----	-----	-----	-----	3,159
Wash.	-----	25,403	-----	-----	-----	-----	200
Total	1,353,079	1,521,753	1,301,018	1,881,140	246,383	358,094	980,661

a One half department internal affairs.

b 1890, see Auditor.

c See Agriculture.

TABLE B—STATE EXPENDITURES

tion—assess- lection, etc.	52 Railway department		53 Insurance depart- ment		54 Bank department		
	1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	\$	
9,375	52,024	54,979	83,428	144,576	21,724	32,542	N. Y.
7,126	8,475	10,390	2,263	3,200	2,500	3,220	Me.
2,050	10,612	7,562	3,908	4,496	5,977	9,311	N. H.
1,550	3,904	4,748	1,215	1,706	-----	-----	Vt.
28,024	28,268	31,857	24,728	33,457	20,387	17,805	Mass.
-----	1,000	1,000	660	2,000	-----	-----	R. I.
-----	11,498	12,123	18,415	25,715	5,181	6,518	Ct.
33,413	500	-----	-----	d 5,140	-----	d 5,140	N. J.
24,353	a 20,950	a 21,790	12,030	21,557	e -----	35,181	Pa.
-----	-----	-----	-----	1,500	-----	-----	Del.
4,500	-----	-----	-----	-----	-----	-----	Md.
-----	-----	-----	-----	-----	-----	700	W. Va.
132,768	4,824	4,299	-----	-----	-----	-----	Va.
826	-----	10,409	-----	-----	-----	-----	N. C.
25,051	7,500	7,400	-----	-----	-----	-----	S. C.
-----	10,124	11,824	-----	-----	-----	1,523	Ga.
64,347	9,184	-----	-----	696	-----	-----	Fla.
9,154	9,717	7,135	-----	-----	-----	-----	Miss.
1,954	12,193	13,347	-----	-----	-----	-----	Ala.
173,541	-----	-----	-----	-----	-----	-----	La.
-----	b -----	31,145	c -----	c -----	-----	-----	Tex.
31,115	-----	-----	-----	-----	-----	-----	Ark.
1,151	-----	-----	-----	-----	-----	-----	Tenn.
121,107	7,024	6,700	35,871	13, 71	-----	-----	Ky.
2,709	4,456	14,258	12,129	20,110	-----	-----	O.
14,315	-----	-----	-----	-----	-----	-----	Ind.
11,148	19,112	22,631	-----	33,428	-----	-----	Ill.
186,801	8,309	8,054	6,201	5,275	7,384	9,119	Mich.
1,389	8,238	5,598	4,605	5,538	-----	2,555	Wis.
2,692	13,622	15,610	4,702	5,600	-----	-----	Minn.
-----	14,785	13,348	-----	-----	-----	-----	Ia.
171,747	12,178	11,215	15,995	11,900	-----	6,140	Mo.
-----	12,500	11,989	5,500	5,000	-----	8,995	Kan.
61,921	9,731	13,078	-----	-----	1,595	3,166	Neb.
1,879	7,007	5,820	-----	-----	-----	-----	S. D.
636	6,582	10,323	4,305	4,842	-----	-----	N. D.
2,030	-----	-----	-----	570	-----	-----	Mont.
238	-----	-----	-----	450	-----	-----	Wyo.
-----	26,000	-----	12,230	9,609	-----	-----	Col.
-----	-----	-----	-----	-----	-----	-----	Nev.
20,389	17,264	17,666	6,172	8,428	15,692	21,936	Cal.
7,692	9,500	10,446	-----	-----	-----	-----	Ore.
-----	-----	-----	-----	-----	-----	-----	Ida.
7,802	-----	-----	-----	-----	-----	-----	U.
134	-----	-----	-----	-----	-----	-----	Wash.
1,114,927	367,081	396,744	354,357	367,964	80,440	163,851	Total

d One half department banking and insurance.

e Department internal affairs.

TABLE B—STATE EXPENDITURES

States	55 Public health		56 Labor—statistics and inspection		57 Mines—statistics and inspection		58 Board of
	1890	1895	1890	1895	1890	1895	1890
	\$	\$	\$	\$	\$	\$	\$
N. Y.	<i>a</i> 241,981	188,775	47,566	86,447	.....	2,411	17,837
Me.	4,694	9,482	4,543	5,446	.....	.....	.....
N. H.	4,288	6,234	.....	3,893	.....	.....	.....
Vt.	1,101	1,441	.....	.....	.....	.....	.....
Mass.	<i>b</i> 41,973	<i>b</i> 59,645	<i>c</i> 91,956	<i>c</i> 113,835	.....	.....	7,894
R. I.	3,244	8,740	2,237	8,547	.....	.....	.....
Ct.	8,069	17,274	12,168	13,165	.....	.....	.....
N. J.	8,826	10,244	20,595	24,144	.....	.....	.....
Pa.	5,000	47,912	<i>d</i> 26,126	<i>d</i> 53,344	48,948	66,277	.....
Del.	701	1,000	.....	.....	.....	.....	.....
Md.	6,535	9,547	5,645	5,073	1,500	1,500	.....
W. Va.	1,955	1,908	2,072	2,416	5,113	5,134	.....
Va.	5,392	7,016	.....	.....	.....	.....	.....
N. C.	4,465	4,652	2,698	3,334	.....	.....	.....
S. C.	10,600	6,640	.....	.....	.....	.....	.....
Ga.	3,000	.....	.....	.....	.....	.....	.....
Fla.	27,327	16,428	.....	.....	.....	.....	.....
Miss.	5,392	6,948	.....	.....	.....	.....	.....
Ala.	3,100	3,533	.....	.....	.....	1,899	.....
La.	.....	.....	.....	.....	.....	.....	.....
Tex.	58,813	32,354	<i>e</i>	<i>e</i> .....	.....	.....	.....
Ark.	.....	975	.....	.....	.....	1,568	.....
Tenn.	5,798	5,317	.....	3,942	1,215	.....	.....
Ky.	2,500	2,500	.....	.....	2,839	3,500	.....
O.	5,326	8,007	17,470	38,027	12,953	16,359	.....
Ind.	5,000	5,423	1,505	8,945	2,850	4,500	.....
Ill.	12,624	9,169	7,082	23,851	9,000	14,851	.....
Mich.	16,036	17,501	7,873	13,561	2,500	1,875	.....
Wis.	5,824	5,506	8,106	8,581	.....	.....	.....
Minn.	5,843	9,022	5,877	11,680	.....	.....	.....
Ia.	6,137	6,219	2,277	2,625	6,088	6,218	.....
Mo.	2,006	4,680	8,243	11,125	<i>g</i> 15,770	<i>g</i> 9,728	.....
Kan.	3,445	3,492	4,000	4,989	2,000	2,000	.....
Neb.	.....	75	4,050	3,025	.....	.....	.....
S. D.	558	500	1,968	1,071	860	1,250	.....
N. D.	280	883	.....	<i>e</i> .....	.....	.....	.....
Mont.	.....	.....	<i>f</i> 2,340	<i>e</i>	3,150	5,145	<i>290</i>
Wyo.	.....	.....	.....	.....	3,987	2,890	.....
Col.	1,000	1,250	3,353	3,300	17,000	12,387	.....
Nev.	.....	523	.....	.....	.....	.....	.....
Cal.	4,861	8,708	5,350	10,542	51,084	25,134	.....
Ore.	1,800	2,164	.....	.....	.....	.....	.....
Ida.	.....	.....	.....	.....	.....	125	.....
U.	.....	.....	.....	.....	.....	1,029	.....
Wash.	.....	2,602	.....	.....	4,433	3,492	.....
Total	525,494	534,287	295,100	464,908	191,290	189,373	26,021

a Largely quarantine buildings. *b* Including investigation of inland waters. *c* Including collection of general statistics. *d* Including geology. *e* Department of agriculture, in-

TABLE B—STATE EXPENDITURES

arbitration	59 Agriculture—Immigrat'n, weather serv. etc.		60 Dairy and food inspection		61 Forestry		
	1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	\$	
15,461	126,741	376,081	97,499	Agriculture	26,793	45,189	N. Y.
-----	14,181	31,621	-----	-----	-----	-----	Me.
-----	7,096	16,232	500	-----	-----	2,193	N. H.
-----	6,565	6,689	-----	-----	-----	-----	Vt.
10,306	59,298	j 313,689	10,110	18,735	-----	-----	Mass.
-----	5,984	33,756	-----	-----	-----	-----	R. I.
-----	19,487	76,227	2,714	4,100	-----	-----	Ct.
8,732	20,399	35,764	11,181	14,524	-----	-----	N. J.
-----	24,910	54,820	-----	6,813	-----	4,188	Pa.
-----	2,300	767	-----	-----	-----	-----	Del.
-----	7,498	12,865	-----	-----	-----	-----	Md.
-----	-----	2,197	-----	-----	-----	-----	W. Va.
-----	10,540	13,940	-----	-----	-----	-----	Va.
-----	39,200	19,254	-----	-----	-----	-----	N. C.
-----	23,835	762	-----	-----	-----	-----	S. C.
-----	26,689	20,036	-----	-----	-----	-----	Ga.
-----	20,501	9,359	-----	-----	-----	-----	Fla.
-----	1,000	1,000	-----	-----	-----	-----	Miss.
-----	21,961	28,303	-----	-----	-----	-----	Ala.
-----	10,520	25,570	-----	-----	-----	-----	La.
-----	h 52,614	h 11,577	-----	-----	-----	-----	Tex.
-----	3,910	3,772	-----	-----	-----	-----	Ark.
-----	13,500	5,000	-----	-----	-----	-----	Tenn.
-----	6,189	6,472	-----	-----	-----	-----	Ky.
2,193	26,512	36,108	6,220	51,880	713	18	O.
-----	18,631	16,013	-----	-----	-----	-----	Ind.
2,925	47,836	110,604	-----	1,000	-----	-----	Ill.
-----	7,745	7,897	-----	1,984	-----	-----	Mich.
171	52,107	45,747	7,425	9,562	-----	51	Wis.
-----	i 117,391	i 184,262	21,287	15,799	22,614	23,109	Minn.
-----	26,028	32,143	3,039	4,566	-----	-----	Ia.
-----	21,610	19,016	-----	-----	-----	-----	Mo.
-----	13,988	23,256	-----	-----	6,720	4,877	Kan.
-----	j 53,488	j 8,333	-----	921	-----	-----	Neb.
-----	16,905	600	-----	-----	1,643	407	S. D.
-----	4,842	9,630	-----	-----	339	7,703	N. D.
-----	j 26,022	j 42,531	-----	-----	-----	-----	Mont.
-----	j 20,018	3,597	-----	-----	-----	-----	Wyo.
-----	27,692	20,017	3,000	1,986	-----	-----	Col.
-----	3,690	3,659	-----	-----	-----	-----	Nev.
25	128,513	143,163	-----	482	17,872	3,064	Cal.
-----	12,210	23,153	1,500	1,626	-----	-----	Ore.
-----	-----	208	-----	-----	-----	-----	Ida.
-----	-----	1,114	-----	-----	-----	-----	U.
-----	-----	18,567	-----	1,574	-----	-----	Wash.
39,813	1,150,146	1,855,361	164,475	135,552	76,694	90,799	Total

district police. d Including one half department internal affairs. e See under Agriculture, insurance and statistics. f Chiefly grain inspection. j Chiefly stock inspection.

TABLE B—STATE EXPENDITURES

States	62 Game and fish (including shell-fish)		63 Public lands		64 Geologic and topo- graphic survey	
	1890	1895	1890	1895	1890	1895
	\$	\$	\$	\$	\$	\$
N. Y.	56,194	71,039	19,952	66,060	-----	10,000
Me.	11,256	33,070	2,771	2,700	-----	-----
N. H.	3,674	8,386	-----	-----	-----	-----
Vt.	1,489	4,662	-----	-----	-----	313
Mass.	21,154	13,449	-----	-----	8,702	12,598
R. I.	2,662	3,884	-----	-----	-----	-----
Ct.	a 17,173	a 10,685	-----	-----	6,803	-----
N. J.	a 11,921	a 29,738	-----	11,000	14,248	17,228
Pa.	6,813	24,250	3,500	-----	-----	8,525
Del.	5,419	4,497	-----	-----	-----	-----
Md.	a 86,502	a 68,860	5,787	5,865	-----	-----
W. Va.	-----	500	-----	-----	-----	-----
Va.	a 23,033	a 35,471	1,500	2,280	-----	-----
N. C.	1,065	929	4,320	1,009	-----	9,901
S. C.	-----	-----	-----	-----	-----	-----
Ga.	-----	-----	-----	-----	1,718	9,094
Fla.	50	-----	-----	-----	-----	-----
Miss.	-----	-----	-----	-----	-----	-----
Ala.	-----	1,498	-----	-----	5,000	7,500
La.	-----	-----	-----	4,570	-----	11,800
Tex.	-----	-----	55,283	50,317	-----	-----
Ark.	-----	-----	10,483	8,361	14,724	105
Tenn.	-----	-----	465	-----	-----	375
Ky.	-----	-----	5,704	4,783	15,338	10,370
O.	9,809	7,846	-----	-----	1,360	-----
Ind.	1,000	800	3,136	-----	165	4,339
Ill.	9,931	10,979	-----	-----	-----	-----
Mich.	33,802	35,682	14,320	14,853	8,397	7,774
Wis.	17,358	16,802	22,726	20,845	-----	-----
Minn.	6,100	17,109	12,808	23,054	1,374	-----
Ia.	1,741	3,628	-----	721	-----	13,194
Mo.	3,000	7,326	5,645	-----	See Mines	-----
Kan.	-----	499	-----	200	-----	630
Neb.	7,094	5,941	10,733	1,593	-----	-----
S. D.	-----	-----	4,918	7,946	-----	250
N. D.	-----	-----	4,686	11,135	-----	-----
Mont.	-----	-----	-----	8,231	-----	-----
Wyo.	2,578	6,671	-----	3,757	3,055	-----
Col.	5,454	10,248	10,778	11,656	-----	-----
Nev.	681	3,646	10,175	7,301	-----	-----
Cal.	18,416	21,368	13,270	13,868	-----	-----
Ore.	3,366	3,367	5,163	4,492	-----	-----
Ida.	-----	-----	-----	12,500	-----	-----
U.	-----	547	150	5,271	-----	-----
Wash.	2,394	a 11,760	9,844	41,062	2,393	-----
Total	371,129	475,137	238,117	345,430	83,277	123,996

a Chiefly for protection of shell-fish. b Actual amount transferred from general fund; state library building. c Expense distributed among departments.

TABLE B—STATE EXPENDITURES

65 Public works		66 Public buildings— construction		67 Public buildings—care and maintenance		
1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	
51,753,834	51,160,528	169,482	138,780	170,062	295,221	N. Y.
726	8,307	86,157	.....	9,506	27,342	Me.
8,226	9,633	.....	d 94,604	7,549	6,739	N. H.
12,636	92,450	.....	.....	.....	5,070	Vt.
137,527	203,262	.....	.....	35,248	90,195	Mass.
50,102	82,050	1,822	92,494	22,691	28,270	R. I.
84,000	33,818	.....	.....	34,898	36,700	Ct.
.....	76,515	23,302	28,252	48,600	55,193	N. J.
200,000	.....	.....	36,538	67,362	192,492	Pa.
.....	.....	.....	5,473	240	1,508	Del.
42,180	500	17,519	.....	8,213	26,938	Md.
.....	.....	.....	2,500	9,175	6,561	W. Va.
220	522	.....	d 113,554	17,044	16,988	Va.
98	28	.....	.....	1,417	1,413	N. C.
.....	1,934	45,709	.....	7,997	8,606	S. C.
.....	.....	.....	.....	31,229	25,030	Ga.
.....	3,346	.....	.....	2,988	4,093	Fla.
8,292	.....	.....	.....	7,578	5,801	Miss.
14,000	372	.....	.....	23,968	8,853	Ala.
c 757,594	c1,035,967	.....	.....	6,607	6,834	La.
.....	.....	.....	.....	62,115	22,362	Tex.
.....	.....	.....	.....	4,931	6,077	Ark.
.....	.....	.....	.....	6,127	15,892	Tenn.
.....	.....	.....	.....	14,401	18,931	Ky.
206,388	173,771	.....	.....	23,272	18,614	O.
1,065	.....	.....	.....	34,636	37,630	Ind.
5,795	6,172	.....	.....	35,162	36,576	Ill.
12,658	.....	10,000	.....	48,666	57,500	Mich.
.....	18,950	.....	.....	85,864	73,543	Wis.
24,710	45,193	.....	8,660	19,078	36,148	Minn.
.....	.....	18,764	.....	36,679	42,992	Ia.
.....	15,793	5,300	.....	12,435	9,734	Mo.
.....	7,314	229,879	.....	14,150	28,614	Kan.
.....	4,883	82,615	.....	37,126	27,776	Neb.
.....	1,350	.....	.....	1,177	2,680	S. D.
.....	.....	21,459	.....	16,573	21,819	N. D.
.....	.....	1,446	.....	.....	4,121	Mont.
4,374	10,088	97,141	7,512	752	120	Wyo.
62,063	34,786	271,540	162,538	17,742	23,419	Col.
.....	.....	.....	.....	7,525	7,381	Nev.
346,488	373,706	9,959	.....	123,062	70,326	Cal.
58,000	3,267	611	22,623	19,770	22,867	Ore.
.....	3,975	13,656	41,574	2,869	5,000	Ida.
30,600	.....	.....	.....	12,000	3,882	U.
.....	23,882	.....	.....	1,806	15,225	Wash.
3,821,576	3,432,360	1,063,456	778,007	1,150,290	1,459,076	Total

canal fund has separate accounts. c Largely spent by special levee districts. d Erection of

TABLE B—STATE EXPENDITURES

States	68 Interest on debt		69 Reduction of debt		70 Special purposes	
	1890	1895	1890	1895	1890	1895
	\$	\$	\$	\$	\$	\$
N. Y.	15,000	<i>a</i> 26,309	715,000	-----	{ <i>c</i> 16,931 { <i>c</i> 20,745	
Me.	97,221	75,440	129,500	50,000	{ <i>d</i> 26,099 { <i>d</i> 24,019	
N. H.	163,291	143,499	-----	-----	<i>e</i> 20,126 <i>e</i> 19,670	
Vt.	24,855	<i>b</i> 8,130	-----	-----	<i>d</i> 659	-----
Mass.	1,523,566	1,158,559	157,586	176,479	<i>c</i> 15,182 <i>c</i> 18,826	
R. I.	77,436	53,277	50,000	50,000	-----	-----
Ct.	126,809	108,370	-----	-----	-----	-----
N. J.	16,625	-----	90,000	65,000	-----	-----
Pa.	581,320	241,718	1,507,051	-----	-----	-----
Del.	37,955	30,297	-----	-----	-----	-----
Md.	459,496	280,049	11,700	282,248	-----	-----
W. Va.	10,171	<i>a</i> 2,383	-----	-----	-----	-----
Va.	443,928	722,331	-----	-----	-----	-----
N. C.	292,084	297,029	-----	-----	-----	-----
S. C.	402,794	270,036	-----	11,601	-----	<i>g</i> 750,474
Ga.	676,302	364,000	104,965	2,500	-----	-----
Fla.	70,833	51,256	-----	-----	-----	-----
Miss.	<i>b</i> 38,974	<i>b</i> 32,260	20,000	-----	<i>f</i> 53,706	-----
Ala.	383,598	393,650	-----	-----	-----	-----
La.	485,980	527,121	-----	205,283	-----	-----
Tex.	277,582	222,616	-----	-----	-----	-----
Ark.	-----	-----	-----	-----	-----	-----
Tenn.	1,048,173	734,768	-----	-----	-----	-----
Ky.	132,796	135,722	-----	-----	-----	-----
O.	355,217	337,828	255,000	257,100	-----	-----
Ind.	274,074	249,121	-----	300,400	-----	-----
Ill.	<i>b</i> 71,779	<i>b</i> 69,925	-----	-----	<i>d</i> 4,193 <i>d</i> 4,751	
Mich.	<i>b</i> 378,686	<i>b</i> 377,554	-----	-----	-----	-----
Wis.	<i>b</i> 157,700	<i>b</i> 157,570	-----	-----	-----	-----
Minn.	190,988	80,582	37,457	118,616	-----	-----
Ia.	15,455	2,271	-----	-----	-----	<i>d</i> 7,491
Mo.	584,432	453,206	356,219	290,461	-----	-----
Kan.	66,901	59,713	35,173	94,709	-----	-----
Neb.	36,001	35,941	-----	90,051	-----	-----
S. D.	34,664	63,625	-----	-----	-----	-----
N. D.	30,720	51,385	-----	-----	-----	-----
Mont.	-----	-----	-----	-----	-----	-----
Wyo.	19,012	19,200	-----	-----	-----	-----
Col.	34,764	76,524	-----	-----	-----	-----
Nev.	<i>b</i> 25,229	<i>b</i> 12,927	25,000	-----	-----	-----
Cal.	<i>b</i> 158,220	166,431	9,541	-----	-----	-----
Ore.	-----	-----	-----	-----	-----	-----
Ida.	10,671	6,547	-----	-----	-----	-----
U.	6,535	46,888	-----	-----	-----	-----
Wash.	-----	10,500	-----	-----	-----	-----
Total	9,837,835	8,156,558	3,504,192	1,994,448	136,896	845,976

a On temporary loans only. *b* All or nearly all paid on irredeemable debt to endowment convention. *g* Gross expenditures of state dispensary. A net profit is earned; see col. 15. of the year. *f* Warrants drawn; these exceed considerably cash payments, leaving large

TABLE B—STATE EXPENDITURES

71 Miscellaneous		72 Total expenditures		
1890	1895	1890	1895 *	
\$	\$	\$	\$	
179,176	184,389	13,170,067	15,775,374	N. Y.
24,233	24,408	1,326,759	1,586,983	Me.
24,459	8,932	549,945	762,289	N. H.
9,622	19,461	382,075	700,696	Vt.
204,400	241,249	6,047,649	7,067,620	Mass.
37,606	72,707	1,169,602	1,721,431	R. I.
8,747	20,361	1,887,330	2,344,428	Ct.
61,477	57,803	3,787,605	4,683,311	N. J.
131,214	121,926	8,168,861	12,106,682	Pa.
18,320	15,074	198,543	299,971	Del.
77,629	20,722	2,019,452	2,076,055	Md.
14,062	86,525	940,210	1,068,612	W. Va.
28,980	20,583	2,695,659	3,404,097	Va.
28,686	70,331	1,062,518	1,349,336	N. C.
27,409	64,424	1,154,929	1,079,241	S. C.
18,326	55,303	2,131,793	2,739,756	Ga.
11,619	6,625	696,600	714,013	Fla.
27,468	7,341	1,022,291	1,486,553	Miss.
30,017	63,126	1,701,176	1,963,907	Ala.
67,636	12,845	2,403,920	2,750,918	La.
19,852	27,795	4,804,652	5,111,948	Tex.
7,291	5,916	714,771	867,178	Ark.
45,512	38,554	1,779,996	1,680,811	Tenn.
15,365	22,079	3,378,240	3,491,069	Ky.
21,402	25,484	5,861,476	6,187,746	O.
18,796	53,037	4,277,577	6,026,548	Ind.
31,025	55,130	3,329,814	5,101,960	Ill.
34,627	28,928	3,104,674	3,617,130	Mich.
49,280	150,708	2,335,601	2,100,689	Wis.
66,630	101,746	3,057,157	4,645,837	Minn.
17,782	49,335	1,877,426	1,985,288	Ia.
6,540	12,718	2,942,660	3,597,775	Mo.
36,991	54,085	2,589,100	2,244,953	Kan.
9,984	29,819	1,745,181	1,995,942	Neb.
25,696	7,146	481,721	544,645	S. D.
18,823	35,472	372,185	908,191	N. D.
14,567	57,612	165,703	582,671	Mont.
200	17,056	198,222	222,183	Wyo.
54,149	33,869	1,111,575	1,429,863	Col.
7,704	22,361	344,772	398,775	Nev.
56,460	36,572	6,973,620	8,117,292	Cal.
28,412	58,971	729,388	1,054,607	Ore.
21	32,465	119,585	318,353	Ida.
11,762	38,532	467,889	474,416	U.
4,986	18,268	625,128	741,982	Wash.
1,634,941	2,137,792	105,904,997	129,129,225	Total

funds. c Civil service commission. d State museum. e Aid to Indians. f Constitutional
 A Chiefly deficiencies. f Besides \$167,569 certificates of indebtedness issued for expenditures
 floating debt. k Cash paid; warrants drawn much larger sum.

TABLE C—STATE ENDOWMENT FUNDS

States	73 School fund—Capital		74 School fund—Interest		75 School fund—Endowment added during year	
	1890	1895	1890	1895	1890	1895
	\$	\$	\$	\$	\$	\$
N. Y.	8,321,861	8,721,862	340,712	325,404	41,357	26,274
Me.	a 442,757	a 442,757	27,565	27,565	.....	.....
N. H.	.....	.....	.....	.....	.....	.....
Vt.	.....	.....	.....	.....	.....	.....
Mass.	2,729,396	3,870,548	130,318	173,395	19,671	100,000
R. I.	273,330	282,435	11,274	9,105	.....	.....
Ct.	2,020,073	2,013,102	119,430	127,941	.....	.....
N. J.	.....	.....	.....	.....	.....	.....
Pa.	2,533,547	3,498,490	120,587	137,670	.....	.....
Del.	b 495,749	b 546,577	29,441	31,221	.....	.....
Md.	312,349	312,149	20,177	18,232	.....	.....
W. Va.	651,583	838,471	31,912	43,076	29,630	34,396
Va.	b 2,092,249	b 2,233,249	43,744	43,559	.....	.....
N. C.	a 99,250	a 143,250	3,970	5,730	.....	.....
S. C.	.....	.....	.....	.....	.....	.....
Ga.	.....	.....	.....	.....	.....	.....
Fla.	b 593,558	b 656,100	† .....	.....	.....	.....
Miss.	a 1,664,025	a 1,664,025	57,692	57,692	.....	.....
Ala.	a 2,675,391	a† 2,675,391	143,938	143,938	.....	.....
La.	a 1,219,564	a 1,374,797	42,735	46,827	18,586	21,652
Tex.	7,454,432	7,579,144	385,515	394,237	525,037	115,521
Ark.	a 560,165	a 639,913	.....	.....	49,881	26,553
Tenn.	a 2,512,500	a 2,512,500	134,008	137,775	.....	.....
Ky.	a 1,705,946	a 2,312,596	102,356	144,754	.....	.....
O.	a 4,031,001	a 4,064,025	240,506	244,794	17,164	1,994
Ind.	9,765,598	† 9,765,598	549,681	773,052	.....	.....
Ill.	b 948,955	b 948,955	56,937	56,937	.....	.....
Mich.	a 4,362,380	a 4,582,838	287,178	302,864	40,387	26,816
Wis.	b 2,768,398	b 3,432,763	160,637	185,515	35,480	35,433
Minn.	b 4,473,181	4,744,796	179,807	189,262	241,121	488,500
Ia.	4,475,598	4,708,208	258,663	236,365	.....	.....
Mo.	a 3,134,000	a 3,140,000	185,790	186,090	.....	.....
Kan.	5,307,953	6,062,332	274,943	330,481	416,482	55,280
Neb.	2,758,557	3,631,789	234,800	323,132	378,088	113,041
S. D.	.....	650,122	.....	34,855	.....	31,023
N. D.	.....	d 395,684	.....	d 17,781	.....	d 51,223
Mont.	.....	156,588	.....	4,663	.....	39,133
Wyo.	.....	.....	.....	.....	.....	.....
Col.	857,149	1,136,739	8,887	29,207	184,232	22,503
Nev.	1,060,121	1,144,541	33,651	29,712	32,057	.....
Cal.	3,268,350	3,788,800	216,943	204,406	170,603	41,575
Ore.	c 2,203,554	c 2,531,617	139,142	121,568	178,449	59,448
Ida.	10,919	112,585	691	9,128	.....	22,082
U.	.....	233,192	.....	.....	.....	† 31,363
Wash.	.....	† .....	.....	26,884	.....	.....
Total	87,763,439	97,548,528	4,573,630	5,174,817	2,378,225	1,343,810

a Consists solely of state bonds, usually irredeemable. b Consists chiefly of state bonds, 1894. c Amount loaned students, so called 'permanent endowment,' not ascertainable in 1890.

TABLE C—STATE ENDOWMENT FUNDS

76 University fund— Capital		77 University fund— Interest		78 Univ. fund—Endow- ment added during year		
1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	
473,402	688,576	19,314	19,404	.....	.....	N. Y.
.....	.....	.....	.....	.....	.....	Me.
.....	.....	.....	.....	.....	.....	N. H.
.....	.....	.....	.....	.....	.....	Vt.
.....	.....	.....	.....	.....	.....	Mass.
.....	.....	.....	.....	.....	.....	R. I.
.....	.....	.....	.....	.....	.....	Ct.
.....	.....	.....	.....	.....	.....	N. J.
.....	.....	.....	.....	.....	.....	Pa.
.....	.....	.....	.....	.....	.....	Del.
.....	.....	.....	.....	.....	.....	Md.
f 2,409,255	f 2,466,456	143,544	146,331	.....	.....	W. Va.
.....	.....	.....	.....	.....	.....	Va.
a 270,000	a 275,500	18,900	19,285	.....	.....	N. C.
b 94,488	b 94,900	.....	.....	.....	.....	S. C.
.....	.....	.....	.....	.....	.....	Ga.
a 544,061	544,061	.....	.....	.....	.....	Fla.
a 300,000	a 300,000	24,000	24,000	.....	.....	Miss.
a 136,000	a 136,000	5,440	5,440	.....	.....	Ala.
560,200	578,233	33,268	31,728	8,944	783	La.
f 660,000	f 660,000	38,020	38,020	.....	.....	Tex.
.....	.....	.....	.....	.....	.....	Ark.
a 544,947	a 560,040	31,012	34,668	7,518	.....	Tenn.
c 144,000	666,056	28,836	36,406	.....	115,150	Ky.
.....	.....	.....	.....	.....	.....	O.
a 515,087	a 528,206	35,985	34,209	1,807	3,371	Ind.
b 226,335	b 212,204	12,789	15,323	878	1,516	Ill.
472,616	659,542	22,140	19,225	41,865	60,151	Mich.
a 535,000	a 1,229,839	27,970	61,746	5,000	7,325	Wis.
.....	.....	.....	.....	.....	.....	Minn.
133,641	135,556	7,140	7,585	2,573	2,139	Ia.
35,880	52,065	5,890	8,088	3,091	1,692	Mo.
.....	.....	.....	.....	.....	.....	Kan.
.....	.....	.....	.....	.....	.....	Neb.
.....	.....	.....	.....	.....	.....	S. D.
.....	.....	.....	.....	.....	.....	N. D.
.....	.....	.....	.....	.....	.....	Mont.
64,061	80,908	647	3,511	4,331	269	Wyo.
.....	.....	.....	.....	.....	.....	Col.
122,809	127,025	2,885	3,215	943	.....	Nev.
b 1,063,500	b 856,500	86,458	59,590	.....	.....	Cal.
c 102,106	c 102,155	7,116	6,089	6,530	384	Ore.
.....	72,933	.....	.....	.....	2,746	Ida.
.....	.....	.....	.....	.....	.....	U.
.....	.....	.....	.....	.....	.....	Wash.
9,415,388	11,026,757	551,354	573,863	83,480	195,526	Total

usually irredeemable. c Includes notes on land sales. d Figures for year ending June 30, f State bonds held by various private institutions.

TABLE C—STATE ENDOWMENT FUNDS

States	79 Agricultural college fund Capital		80 Agricultural college fund—Interest		81 Agric. col. fund—En- dow. added during year	
	1890	1895	1890	1895	1890	1895
	\$	\$	\$	\$	\$	\$
N. Y.	.....	.....	.....	.....	.....	.....
Me.	a 218,300	a 218,300	9,925	9,925	.....	.....
N. H.	a 80,000	539,545	4,800	22,475	.....	e 22,475
Vt.	a 135,500	a 135,500	8,130	8,130	.....	.....
Mass.	360,575	360,575	16,315	16,640	.....	.....
R. I.	.....	.....	.....	.....	.....	.....
Ct.	135,000	135,000	5,591	6,368	.....	.....
N. J.	a 116,000	a 116,000	6,960	5,994	.....	.....
Pa.	a 500,000	a 500,000	30,000	30,000	.....	.....
Del.	a 83,000	a 83,000	4,980	4,980	.....	.....
Md.	115,943	115,943	7,474	6,142	.....	.....
W. Va.	.....	.....	.....	.....	.....	.....
Va.	.....	.....	.....	.....	.....	.....
N. C.	.....	.....	.....	.....	.....	.....
S. C.	a 191,800	a 191,800	11,508	11,508	.....	.....
Ga.	.....	.....	.....	.....	.....	.....
Fla.	b 155,838	b 153,800	f	.....	.....	.....
Miss.	a 227,150	227,150	11,357	11,357	.....	.....
Ala.	a 263,074	253,500	20,280	20,280	.....	.....
La.	a 182,313	a 182,313	9,116	9,116	.....	.....
Tex.	a 209,000	a 209,000	14,280	14,280	.....	.....
Ark.	.....	.....	.....	.....	.....	.....
Tenn.	a 800,000	a 800,000	25,000	25,000	.....	.....
Ky.	a 165,000	a 143,000	9,900	8,580	.....	.....
O.	.....	.....	.....	.....	.....	.....
Ind.	a 340,000	a 340,000	17,000	17,000	.....	.....
Ill.	.....	.....	.....	.....	.....	.....
Mich.	a 373,610	a 530,564	25,053	36,871	15,991	4,626
Wis.	297,456	271,270	9,348	12,496	3,685	2,001
Minn.	.....	.....	.....	.....	.....	.....
Ia.	356,888	496,436	d 32,862	d 23,480	d	d
Mo.	.....	.....	.....	.....	.....	.....
Kan.	534,055	490,123	32,458	28,763	2,129	720
Neb.	51,813	101,955	See Univer	sity fund	6,155	8,777
S. D.	.....	.....	.....	.....	.....	.....
N. D.	.....	.....	.....	.....	.....	.....
Mont.	.....	.....	.....	.....	.....	.....
Wyo.	.....	.....	.....	.....	.....	.....
Col.	15,112	59,066	.....	2,745	1,426	7,009
Nev.	.....	.....	.....	.....	.....	.....
Cal.	.....	.....	.....	.....	.....	.....
Ore.	c 130,289	c 132,436	9,584	7,354	5,881	1,207
Ida.	.....	.....	.....	.....	.....	.....
U.	.....	.....	.....	.....	.....	.....
Wash.	.....	.....	.....	.....	.....	.....
Total	6,037,716	6,786,276	321,921	339,484	35,267	46,815

a Consists wholly of state bonds, usually irredeemable. b Consists chiefly of state bonds, to endowment. c Interest accumulating. f Teachers' institute fund.

TABLE C—STATE ENDOWMENT FUNDS

88 Normal school fund Capital		88 Normal school fund Interest		84 Normal school fund Endowment added during year		
1890	1895	1890	1895	1890	1895	
\$	\$	\$	\$	\$	\$	
.....	N. Y.
.....	Me.
f 53,584	f 57,721	3,130	2,908	.....	.....	N. H.
.....	Vt.
12,100	12,100	433	458	.....	.....	Mass.
.....	R. I.
.....	Ct.
.....	N. J.
.....	Pa.
.....	Del.
.....	Md.
.....	W. Va.
.....	Va.
.....	N. C.
.....	S. C.
.....	Ga.
.....	Fla.
.....	Miss.
.....	Ala.
.....	La.
.....	Tex.
.....	Ark.
.....	Tenn.
.....	Ky.
.....	O.
.....	Ind.
a 216,452	a 216,452	12,987	12,967	.....	.....	Ill.
a 63,960	a 65,685	3,822	3,610	299	180	Mich.
1,505,418	1,768,764	81,365	100,408	22,479	28,879	Wis.
.....	Minn.
.....	Ia.
.....	Mo.
.....	Kan.
124,199	146,787	6,320	7,651	15,589	1,993	Neb.
22,163	34,000	1,300	1,629	3,968	1,251	S. D.
.....	700	N. D.
.....	Mont.
.....	Wyo.
.....	Col.
.....	Nev.
.....	Cal.
.....	Ore.
.....	Ida.
.....	U.
.....	Wash.
1,927,876	2,301,509	109,357	129,646	42,330	33,006	Total

c Including notes for sale of lands. d Partly interest and partly from sale of lands added

TABLE D—STATE DEBTS

States	85 Bonds held by individuals		86 Bonds held by endowment funds		84 Total (funded)	
	1890	1895	1890	1895	1890	1895
	\$	\$	\$	\$	\$	\$
N. Y.	6,214,854	-----	560,000	688,576	6,774,854	688,576
Me.	2,401,300	2,134,700	940,977	986,631	3,342,277	3,101,331
N. H.	2,520,600	1,814,300	133,584	137,721	2,654,184	1,952,021
Vt.	-----	-----	148,416	135,509	148,416	135,500
Mass.	31,381,158	29,675,229	-----	-----	31,381,158	29,675,229
R. I.	1,283,000	1,500,000	-----	-----	1,283,000	1,500,000
Ct.	3,740,200	3,240,300	-----	-----	3,740,200	3,240,300
N. J.	862,300	471,400	234,000	189,000	1,096,300	660,400
Pa.	11,849,920	6,316,309	500,000	500,000	12,349,920	6,816,309
Del.	660,000	480,000	239,750	239,750	899,750	719,750
Md.	10,682,288	8,672,150	8,836	8,836	10,691,124	8,680,986
W. Va.	-----	-----	-----	-----	-----	-----
Va.	37,043,942	528,028,801	c 3,730,083	3,934,283	40,774,025	31,963,084
N. C.	7,603,350	5,924,500	99,250	143,250	7,702,600	6,067,750
S. C.	6,801,119	6,681,348	191,800	191,800	6,992,919	6,873,148
Ga.	10,089,340	8,163,500	270,000	275,500	10,359,340	8,439,000
Fla.	601,500	357,700	673,500	917,300	1,275,000	1,275,000
Miss.	1,264,460	795,849	2,435,237	2,438,959	3,699,697	3,234,808
Ala.	9,249,900	9,354,600	f 3,175,496	23,175,496	12,425,396	12,530,096
La.	11,679,500	10,840,570	1,529,180	1,693,060	13,208,680	12,533,630
Tex.	1,220,630	750,000	3,017,100	3,242,030	4,237,730	3,992,030
Ark.	4,396,997	3,228,272	490,000	990,480	4,886,997	4,218,752
Tenn.	15,706,474	16,667,666	c 3,989,500	e 4,001,500	19,695,974	20,669,166
Ky.	500,000	500,000	1,879,946	2,455,576	2,397,946	2,955,576
O.	2,541,665	1,791,665	4,609,863	4,621,781	7,151,528	6,412,446
Ind.	8,056,615	7,036,615	484,000	484,000	8,540,615	7,520,615
Ill.	19,500	18,500	1,165,407	1,165,407	1,184,907	1,183,907
Mich.	31,992	-----	5,315,039	5,707,294	5,347,031	5,707,295
Wis.	-----	-----	2,251,000	2,251,000	2,251,000	2,251,000
Minn.	1,686,000	1,475,000	2,679,000	484,000	4,365,000	1,959,000
Ia.	-----	-----	245,435	-----	245,435	-----
Mo.	8,533,000	5,000,000	3,680,000	4,369,839	12,213,000	9,369,839
Kan.	574,790	256,000	545,000	496,000	1,119,790	752,000
Neb.	a 705,946	a 2,058,244	326,267	345,267	a 1,032,213	a 2,403,511
S. D.	860,200	1,288,200	-----	-----	860,200	1,238,200
N. D.	689,807	975,807	-----	-----	689,807	975,807
Mont.	a 167,815	a 522,725	-----	-----	a 167,815	a 522,725
Wyo.	320,000	320,000	-----	-----	320,000	320,000
Col.	a 903,064	a 3,157,509	744,061	c -----	a 1,647,155	a 3,157,509
Nev.	-----	-----	560,000	630,000	560,000	630,000
Cal.	278,000	1,100,000	2,359,000	2,277,500	2,637,000	3,377,500
Ore.	1,014	1,829	-----	-----	1,014	1,829
Ida.	146,715	393,000	-----	-----	146,715	393,000
U.	-----	900,000	-----	-----	-----	900,000
Wash.	a 535,510	a 2,185,038	-----	-----	a 535,590	a 2,185,038
Total	203,804,575	174,027,326	49,210,727	49,157,336	253,014,303	223,184,663

a Chiefly floating debt. b Reduction due to refunding at a discount. Small amount of this not recognized. c Some part of amount in column 85, not ascertainable. d About half to be paid by Metropolitan district. e Including bonds held by private educational institutions.

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Appendix 4

State Library Bulletin

LIBRARY SCHOOL No. 2

LIBRARY SCHOOL REGISTER 1887-96

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State Library Bulletin

LIBRARY SCHOOL No. 2

REGISTER FOR FIRST TEN YEARS

OF THE

New York State Library School

January 1887–December 1896

INCLUDING ALL MATRICULATED STUDENTS

Facts are given in the following order: 1) college connection; 2) library school attendance; 3) positions; 4) connection with library associations.

If a student is registered as attending the school and filling a position at the same time, it signifies a leave of absence to attend the school.

Senior certificate. Completion of the first year's course at the New York state library school.

Graduate. Completion of the full two years' course either at Columbia university or at the New York state library.

Columbia certificate. This certificate was granted by Columbia university to students who completed the course there before the school was transferred to the New York state library in 1889.

Diploma. Completion of the full two years' course at the New York state library school.

Diploma with honor. Completion of the full two years' course at the New York state library school with honor (90%).

B. L. S. Completion of two years of college work and of the full two years' course at the New York state library school with honor (90%).

Deaths are indicated by a star prefixed.

CLASS OF 1888

*₁ **Bonnell, Kate.** Library school Jan.–May 1887; cataloguer New York free circulating library 1887; died Sep. 7, 1890.

*₂ **Burgess, Harriet P.** Library school Jan.–May 1887; died Feb. 7, 1896.

3 **Catlin, George.** Library school Jan.–June 1887; previously assistant librarian Free libraries, Birmingham, England; cataloguer University club, New York, winter 1887.

4 **Chapman, Lilian Howe.** Library school Jan.-July, Sep.-Dec. 1887; assistant librarian Y. W. C. A. New York June-Dec. 1887; librarian Cottage City (Mass.) library association Oct. 1885-Oct. 1886, member library committee May 1883-July 1894; classifier and cataloguer Public library, Vineyard Haven, Mass. July-Sep. 1896; proprietor lending library, Cottage City, Mass. July 1893-date.

5 **Cole, George Watson, graduate.** Library school 1887-88, Columbia certificate; cataloguer Public library, Fitchburg, Mass. Aug. 1885-Oct. 1886; librarian Pratt institute free library, Brooklyn Nov. 1886-Sep. 1887; assistant Newberry library, Chicago Ap. 1888-Dec. 1891; public librarian Jersey City Jan. 1891-Nov. 1895; attended A. L. A. meetings 1885, '87, '90, '92, '93, '94, '96, member A. L. A. committee on Library school 1892-93, treasurer A. L. A. 1893-96; vice-president New Jersey library association 1891-94, president 1894-95; secretary New York library club 1892-93, president 1893-94.

6 **Denio, Lilian, graduate.** Library school Jan. 1887-Jan. 1889, Columbia certificate; assistant Wellesley college library July-Aug. 1887; cataloguer Union for Christian work, Brooklyn Nov. 1887-Feb. 1888; cataloguer Public library, Grand Rapids, Mich. Feb. 1889-March 1890; librarian Bryson library, Teachers college New York Ap. 1890-June 1896; attended A. L. A. meetings 1887, '92, '93, '94; vice-president New York library club 1894-95.

7 **Fernald, Harriet Converse, graduate.** B. S. Maine state college, Orono 1884, M. S. 1888; Library school 1887-88, Dec. 1888-Jan. 1889, Columbia certificate; cataloguer Public library, Saugus, Mass. May-June 1887; classifier Bowdoin college library Aug.-Oct. 1887; cataloguer Union for Christian work, Brooklyn Nov. 1887-Feb. 1888; cataloguer Pennsylvania state college library, State College Dec. 1889-June 1890; cataloguer Maine state college library, Orono, Aug.-Nov. 1888; Feb.-June 1889, librarian Dec. 1890-date, in charge of Class in library economy Sep. 1894-date; secretary Maine library association 1891-date.

8 **Godfrey, Lydia Boker, graduate.** Vassar college 1872-74; Ph. B. Boston university 1878; Library school Jan.-Ap. 1888, Columbia certificate; first assistant order department Public library, Boston 1881-83; superintendent catalogue department Wellesley college library 1883-88, reference librarian Sep. 1888-Aug. 1893, librarian Sep. 1893-date, instructor in bibliography Ap. 1888-date, leave of absence in Europe July 1891-Sep. 1892; attended A. L. A. meeting 1894; attended L. A. U. K. meeting 1891.

9 **Goodrich, Harriet.** Library school Jan.-Feb. 1887.

*10 **Griswold, Harriet Sherman.** Library school Jan.-May 1887; public librarian Batavia, N. Y. 1883-86; assistant librarian Y. W. C. A. New York Ap.-June 1887, librarian June 1897-June 1888; died Feb. 2, 1889.

11 **Hutchins, Annie Eliza.** Library school 1887, attended lectures only, gave instruction in dictionary cataloguing; formerly of the Harvard, Boston public and Cornell university libraries; cataloguer in Columbia university, Newberry (Chicago) and Yale university libraries; attended A. L. A. meetings 1879, '89.

12 **Jackson, Annie Brown, graduate.** B. A. Smith college 1882, M. A. 1885; Library school 1887-88, Columbia certificate; member book committee Free public library, North Adams, Mass. 1885-date; president board of trustees 1896-date; vice-president New York state library school association 1894-95.

13 **Jones, Ada Alice, graduate.** Wellesley college 1878-80, 1881-82; Library school 1887-88, Columbia certificate; cataloguer Wellesley college library July 1882-Sep. 1887; assistant librarian Y. W. C. A. New York Nov. 1887-May 1888; cataloguer Columbia university library May 1888-March 1889; librarian Woman's library, World's Columbian exposition, Chicago July-Aug. 1893; cataloguer New York state library Ap. 1889-Sep. 1892, head cataloguer Oct. 1892-date, instructor in cataloguing Library school Oct. 1888-date, secretary of faculty Feb. 1891-date; attended A. L. A. meetings 1890, '93, '94, '95; chairman New York state library school association executive board 1895-96.

14 **Knowlton, Frances S.** Library school Jan.-Ap. 1887.

15 **Miller, Eulora, graduate.** B. S. Purdue university, Lafayette, Ind. 1878; Library school 1887-88, Columbia certificate; librarian Purdue university library 1878-80; assistant librarian Public library, Lafayette, Ind. 1882-87, librarian 1888; librarian Pratt institute free library, Brooklyn 1889-90; married Rufus Platt Jennings Nov. 20, 1890; attended A. L. A. meetings 1887, '89.

16 **Nelson, Martha Furber.** Library school Jan.-June 1887; assistant librarian New York free circulating library Jan. 1886-Jan. 1887; classifier Pratt institute free library, Brooklyn Aug.-Sep. 1887; librarian Union library (W. C. T. U.) Trenton, N. J. Oct. 1887-Sep. 1895; librarian and instructor in bibliography New Jersey state normal school, Trenton Sep. 1895-date; attended A. L. A. meetings 1888, '90, '92, '93; secretary New Jersey library association 1890-93, vice-president 1894-96.

17 **Patten, Frank Chauncey**, *graduate*. Ripon (Wis.) college 1885-86; Library school 1887-88, Columbia certificate; assistant librarian Ripon college library 1883-86; cataloguer New York free circulating library May-Dec. 1887; evening reference clerk Columbia university library Oct. 1887-March 1888, catalogue curator and reference clerk Ap. 1888-March 1889; consulting librarian Y. M. C. A. Albany, N. Y. 1890-92; catalogue and shelf curator New York state library Ap. 1889-July 1892; public librarian Helena, Mont. Aug. 1892-date; attended A. L. A. meetings 1886, '87, '90, '92, '93, '95, '96; treasurer New York state library school association 1895-96.

18 **Plummer, Mary Wright**, *graduate*. Wellesley college 1881-82; Library school Jan. 1887-March 1888, Columbia certificate; assistant in charge cataloguing department Public library, St Louis Ap. 1888-Ap. 1890; instructor in cataloguing Library school Nov.-Dec. 1887, non-resident lecturer on history of libraries March 1896-date; librarian Pratt institute free library, Brooklyn Nov. 1890-June 1895, director of libraries July 1895-date, instructor Library school of Pratt institute 1890-date, year's leave of absence in Europe 1894-95; attended A. L. A. meetings 1887, '89, '90, '91, '92, '93, '96, member A. L. A. committee on Library school 1891-92, member A. L. A. council 1896-date, member European trip committee 1896-date; secretary New York library association 1892-93; vice-president New York library club 1891-92, president 1896-date; member New York state library school association executive board 1895-96.

19 **Seymour, May**, *graduate*. B. A. Smith college 1880; Library school 1887, 1888-89, Columbia certificate; classifier and cataloguer Osterhout free library, Wilkes-Barré, Pa. 1887-88; cataloguer Columbia university library 1888-89; classifier New York state library 1889-91, sub-librarian (education) 1891-date, instructor in elementary classification Library school 1891, instructor in library printing and editing 1891-date; attended A. L. A. meetings 1890, '92, '93, '94.

20 **Stott, Janet Elizabeth**. Library school Jan.-Ap 1887; assistant librarian New York free circulating library Feb. 1882-June 1889; married Richard Lavery Sep. 25, 1889; attended A. L. A. meeting 1887.

21 **Talcott, Eliza S.** B. A. Vassar college 1869; Library school Jan.-May 1887; cataloguer Connecticut mutual life insurance company library, Hartford Oct.-Nov. 1887; assistant cataloguer Union for Christian work, Brooklyn Dec. 1887-March 1888; assistant librarian Public library, Hartford, Ct. March 1888-Ap. 1895; attended A. L. A. meetings 1892, '94.

22 **Woodworth, Florence**, *graduate*. Library school 1887, Jan.-July 1889, Columbia certificate, honor senior certificate 1890;

cataloguer Osterhout free library, Wilkes-Barré, Pa. Aug. 1887-Dec. 1888; cataloguer Columbia university library Jan.-Ap. 1889; librarian Woman's library, World's Columbian exposition, Chicago July-Aug. 1893; cataloguer New York state library Ap. 1889-Sep. 1892, director's assistant Oct. 1892-date, instructor in cataloguing Library school Ap. 1889-Sep 1895, registrar Ap. 1889-Sep. 1892, director's assistant Oct. 1892-date; attended A. L. A. meetings 1890, '93, '94, member A. L. A. committee on World's Columbian exposition 1890-91.

CLASS OF 1889

23 **Baldwin, Elizabeth G.** *graduate*. Library school 1887-89, Columbia certificate; in charge library of Huguenot society of America deposited in Columbia university library Ap. 1889-Feb. 1894, reviser cataloguing department Columbia university library Ap. 1889-Sep. 1896; librarian Bryson library, Teachers college, New York Oct. 1896-date; vice-president New York library club 1895-96, member executive committee 1896-date.

24 **Banks, Mrs Martha Howard (Gordon)**. Library school 1887-89; cataloguer Free public library, Newark, N. J. July-Sep. 1889. Jan-May 1890; classifier and cataloguer James Prendergast free library, Jamestown, N. Y. July-Oct. 1890; cataloguer Longstreet library, Peddie institute, Hightstown, N. J. Dec. 1890-March 1891; librarian Bennett library, Wyoming seminary, Kingston, Pa. March-Dec. 1891; classifier and cataloguer American society of mechanical engineers' library, New York Feb.-Ap. 1892; classifier and cataloguer Slater library, Jewett City, Ct. June 1892-Feb. 1893; classifier and cataloguer City library, Springfield, Mass. July 1895-date; attended A. L. A. meeting 1892.

25 **Brackett, Harriet**. B. A. Bates college 1884, M. A. 1887; Library school Oct. 1888-Feb. 1889, attended lectures only; cataloguer Oberlin college library 1885-87; cataloguer Columbia university library Oct. 1884-85, reviser and cataloguer Jan. 1888-July 1896.

26 **Browne, Nina Eliza**, *graduate*. B. A. Smith college 1882, M. A. 1885; Library school 1887-89, Columbia certificate, B. L. S. 1891; assistant Columbia university library Ap. 1888-Ap. 1889; shelflister New York state library Ap. 1889-Jan. 1892, June-Nov. 1892; classifier and cataloguer Phipps scientific collection, Carnegie free library, Alleghany, Pa. Jan-May, Dec. 1892; librarian Library bureau, Boston Jan. 1893-date; assistant secretary A. L. A. publishing section Oct. 1896-date; attended A. L. A. meetings 1888, '89, '90, '92, '93, '94, '96, registrar A. L. A. 1888-90, 1892-93, assistant secretary 1893-94, assistant recorder 1894-date; secretary Massachusetts library club committee on select fiction 1895-96.

27 Clarke, Edith Emily, graduate. Ph. B. Syracuse university 1881; Library school 1887-89, Columbia certificate; cataloguer Alfred (N. Y.) university library July-Aug. 1888; head cataloguer Columbia university library Ap. 1889-June 1890; cataloguer in charge Woman's library, World's Columbian exposition, Chicago May-Sep. 1893; head cataloguer Newberry library, Chicago Aug. 1890-Nov. 1894; lecturer on dictionary cataloguing Department of library economy Armour institute of technology, Chicago Ap.-Dec. 1894; lecturer on library science Syracuse central library Feb.-March 1895; cataloguer Public documents library, Washington, D. C. July-Dec. 1895, chief of cataloguing Jan. 1896-date; attended A. L. A. meetings 1890, '92, '93, '94, '96, member A. L. A. cooperation committee 1892-93; vice-president Chicago library club 1893-94; vice-president New York state library school association 1894-95.

***28 Cutler, Louisa Salome, graduate.** Graduate Mt Holyoke seminary 1886; Library school 1887-89, Columbia certificate, honor senior certificate 1893; classifier Free public library, Newark, N. J. Ap. - July 1889; librarian Aguilar free library, New York Sep. 1889-Sep. 1891; classifier Colgate university library, Hamilton, N. Y. Nov. 1891-May 1892; librarian A. L. A. library, World's Columbian exposition, Chicago July 1892-Nov. 1893; public librarian, Utica, N. Y. Nov. 1893-Aug. 1895; attended A. L. A. meetings 1886, '87, '90, '91, '92, '93, '94, assistant secretary A. L. A. 1893-95; died Aug. 2, 1895.

29 Gilmore, David Chandler. B. A. University of Rochester 1887, M. A. 1891; Library school Nov. 1887-Feb. 1888; librarian Railroad men's library (branch Y. M. C. A.) New York Feb. 1888-Aug. 1890.

30 Hopson, Ema K. graduate. Library school 1887-89, Columbia certificate; cataloguer Columbia university library Ap. 1889-June 1890; cataloguer Newberry library, Chicago June-Sep. 1890; married Howard Owen Sprogle Oct. 20, 1890; attended A. L. A. meeting 1892.

31 Jones, Gardner Maynard. Library school Jan.-Nov. 1888; assistant Dorchester (Mass.) Athenæum 1863-66, librarian 1866-69; classifier and cataloguer Boston book company Nov. 1888-Feb. 1889; public librarian Salem, Mass. March 1889-date; attended A. L. A. meetings 1888, '90, '92, '93, '94, '96, member A. L. A. cooperation committee 1890-92, member collection committee A. L. A. library, World's Columbian exposition, Chicago 1892-93, chairman A. L. A. committee on subject headings 1892-95, member finance committee 1894-96, member committee on supplement to A. L. A. catalogue 1895-

date, recorder 1896–date, secretary European trip committee 1896–date; attended L. A. U. K. meeting 1887; secretary Massachusetts library club 1890–91, president 1893–94, chairman committee on select fiction 1895–96.

32 Knapp, August. Library school 1887–89.

33. Lee, Rev. Albert. Harvard university 1868–71; graduate Auburn theological seminary 1874; Yale divinity school 1874–75; Library school 1887–89; cataloguer Summerfield methodist episcopal church, Brooklyn 1888; cataloguer Columbia university library 1889–Ap. 1892; cataloguer Harlem library, New York Ap. 1892–Feb. 1893; librarian Mining building, World's Columbian exposition, Chicago May – Oct. 1893; cataloguer private libraries in and near Boston 1894–date, including private library of Hon. R. M. Morse, Boston.

***34 Marsee, Isabella Rebecca, graduate.** Library school Jan. 1888–89, Columbia certificate; reference librarian Public library, Indianapolis, Ind. 1882–89; married Albert Lupton Dec. 11, 1889; died Sep. 22, 1895.

35 Medlicott, Mary, graduate. Library school 1887–89, Columbia certificate; cataloguer Alfred (N. Y.) university library July – Aug. 1888; cataloguer Bryson library, Teachers college, New York Jan. – March 1889. librarian Ap. 1889–Ap. 1890; cataloguer Society for the home study of Holy scripture, New York Aug. 1889–90; assistant in charge reference department City library, Springfield, Mass. Ap. 1890–date; attended A. L. A. meetings 1890, '92, '94, '96; second vice-president Massachusetts library club 1893–94, member committee on select fiction 1895–96; member New York state library school association executive board 1895–96.

36 Palmer, Henrietta Raymer, graduate. Bryn Mawr college 1889–93, B. A. 1893; Library school 1887–89, Columbia certificate; cataloguer Free public library, Newark, N. J. Ap. – July 1889; cataloguer Lilly library, Florence, Mass. July – Sep. 1889; assistant librarian A. L. A. library, World's Columbian exposition, Chicago June – July 1893; cataloguer Bryn Mawr college library Sep. 1889–June 1890, acting librarian 1890–91, associate librarian 1893–Sep. 1895, librarian Sep. 1895–date; attended A. L. A. meeting 1893.

37 Prescott, Harriet Beardslee, graduate. Graduate Mt Holyoke seminary 1886; Library school 1887–89, Columbia certificate; cataloguer Columbia university library Ap. 1889–date; attended A. L. A. meetings 1890, '91, '94, assistant secretary A. L. A. 1896–date; secretary New York library club 1893–95.

38 **Richardson, Mary Abbie.** Library school Jan.—June 1888; classifier and cataloguer Atlanta university library Sep. 1888—June 1889; librarian June 1889—March 1891; public librarian New London, Ct. March 1891—date; attended A. L. A. meetings 1892, '93, '94, '95, '96; assistant secretary Connecticut library association 1892–93, vice-president 1893–94, secretary 1894—date.

39 **Rose, Eleanor Waterhouse.** Library school 1887–88; librarian Connecticut state normal school library, New Britain 1876–77; assistant librarian Y. W. C. A. New York 1886–87; librarian Town library, Framingham, Mass. 1888–89; cataloguer private library, Hartford, Ct. Sep. 1889—March 1890.

40 **Stanton, Irving Gardiner.** B. A. Harvard university 1881; Library school Dec. 1887—Feb. 1889. Has since done library work in connection with editorial work.

41 **Swayze, Mary Camilla, graduate.** Smith college 1880–81; Library school 1887–88, 1889–90, diploma 1891; librarian Y. W. C. A. New York Sep. 1888—June 1889; classifier and cataloguer High school library, Flushing, N. Y. Feb.—March 1894; attended A. L. A. meeting 1892.

42 **Underhill, Caroline Melvin, graduate.** Library school 1887–89, Columbia certificate; classifier and cataloguer New York normal college alumnae library Oct. 1888–Ap. 1889; cataloguer Free public library, Newark, N. J. Ap. 1889–May 1891; librarian Apprentices' library, Philadelphia May 1891—June 1894; acting librarian Public library, Utica, N. Y. Sep.—Nov. 1894, special assistant on printed Finding-list Nov. 1894—May 1895, librarian Aug. 1895—date; attended A. L. A. meetings 1890, '92, '94, '96; treasurer Pennsylvania library club 1892–94.

43 **Ward, Ama Howard, graduate.** Library school 1887–89, Columbia certificate; Amherst summer school of library economy July–Aug. 1894; assistant librarian Y. W. C. A. New York Ap.—Aug. 1888, acting librarian Sep.—Dec. 1888, librarian June 1889—July 1890; attended A. L. A. meeting 1894.

44 **Wire, George E. graduate.** M. D. Northwestern university medical school (Chicago medical college) 1883; LL. B. Kent college of law, Chicago 1895; Library school Jan. 1888–89, Columbia certificate; assistant librarian Northwestern university, Evanston, Ill. Sep. 1885–Dec. 1887; assistant Columbia university library Ap. 1889—June 1890; temporary librarian, Public library, Kankakee, Ill. March 1896; superintendent medical department Newberry library, Chicago July 1890–Dec. 1895; librarian American medical association, Newberry library, Chicago May

1895-May 1896; classifier Public library, Evanston, Ill. Feb.-Aug. 1896; cataloguer private library of Col. H. C. Clarke, Kankakee, Ill. Nov. 1896; classifier and cataloguer Northwestern university medical school library, Chicago Dec. 1896; lecturer Department of library economy Armour institute of technology, Chicago 1893-date; attended A. L. A. meetings 1890, '91, '92, '93, '94, '95, '96, member A. L. A. committee on Library school 1891-92, member committee on subject headings 1893-95, assistant secretary 1895, secretary and treasurer committee on Dr William F. Poole memorial fund 1895-date; member Illinois state library association committee on Illinois state library commission 1896-date; secretary Chicago library club 1891-92, member committee to visit libraries and solicit memberships Feb.-Dec. 1894, second vice-president 1895-96; secretary New York state library school association 1894-95, second vice-president 1895-96, treasurer 1896-date.

CLASS OF 1890

45 Abbott, Herbert Vaughan. B. A. Amherst college 1885; Library school 1888-89.

46 Adams, Gertrude. Library school 1888-89.

47 Beebe, Elizabeth H. Cornell university 1883-84; Library school Oct. 1888, Oct. 1892. In each case left during first month on account of ill-health.

48 Blake, Harriet Cummings. B. A. Wellesley college 1880; Library school Jan.-Feb. 1889; cataloguer Public library, Boston Oct. 1880-Oct. 1886; cataloguer Smith college library Nov. 1887-Apr. 1888; cataloguer Public library, Nashua, N. H. March 1889-Feb. 1891; cataloguer Connecticut state normal school library, New Britain Dec. 1891-Dec. 1892; instructor in dictionary cataloguing Library school Feb.-March 1893; revised dictionary catalogue for A. L. A. library, World's Columbian exposition, Chicago 1893; indexer educational reports Connecticut state board of education, Hartford Sep.-Dec. 1891, cataloguer educational pamphlets Oct.-Dec. 1893; cataloguer Gordon-Nash library, New Hampton, N. H. March-July 1896.

49 Brainerd, Helen Elvira. Graduate Mt Holyoke seminary 1887; Library school 1888-89; cataloguer Columbia university library Ap. 1889-date; attended A. L. A. meeting 1894.

50 Burdick, Esther Elizabeth, graduate. Library school 1888-90, diploma 1891; classifier and cataloguer Town library, Orange Mass. Sep. - Nov. 1890; cataloguer Union for Christian work, Brooklyn, Nov.

1890-Feb. 1891; head cataloguer Public library, Jersey City Feb. 1891-Feb. 1894, assistant librarian March 1894-Nov. 1895, acting librarian Dec. 1895-July 1896, librarian July 1896-date; attended A. L. A. meeting 1892; vice-president New Jersey library association 1896-date.

51 **Cattell, Sarah Ware**, *graduate*. Wellesley college 1887-88; Library school 1888-90, honor diploma 1891; classifier and cataloguer Norfolk (Ct.) library June-Sep. 1889; librarian Y. W. C. A. New York Sep. 1890-June 1896; attended A. L. A. meetings 1892, '94, member A. L. A. committee on Library school and training classes 1893-94.

52 **Clark, Josephine Adelaide**. B. A. Smith college 1880; Library school 1888-89; cataloguer Union for Christian work, Brooklyn Nov. 1889-March 1890; cataloguer Brooklyn institute March-June 1890; assistant librarian Harvard university herbarium library Aug. 1890-Sep. 1891; botanical bibliographer botanical division Department of agriculture, Washington, D. C. Sep. 1891-Oct. 1893, assistant librarian Department of agriculture, Washington, D. C. Oct. 1893-date; member Washington (D. C.) library association executive committee 1895-date.

53 **Fowler, Mary**. B. S. Cornell university 1882; Library school 1888-89; librarian Reading-room, Gouverneur, N. Y. Jan. 1886-Oct. 1888; classifier and cataloguer Norfolk (Ct.) library Nov. 1889-Feb. 1890; classifier and cataloguer Northfield (Mass.) seminary library March-May 1890; first cataloguer Cornell university library Aug. 1890-date; attended A. L. A. meetings 1892, '93.

54 **Green, Katherine Laura**. Library school Oct. 1888-March 1889; cataloguer Franklin typographical society, Boston, three months winter of 1885-86; cataloguer Free public library, Newark, N. J. Ap.-Aug. 1889; assistant order department Public library, Boston Ap.-Oct. 1890; assistant Boston Athenæum Oct. 1889-March 1890, cataloguer Oct. 1890-Feb. 1891; head cataloguer Public library, St Louis Feb. 1891-Jan. 1894; married Edward Cavender Rouse March 7, 1894; attended A. L. A. meeting 1893.

55 **Harvey, Elizabeth**, *graduate*. Library school Oct.-Dec. 1888, 1889-90, diploma 1891; cataloguer Osterhout free library, Wilkes-Barré, Pa. Jan.-Sep. 1888, classifier and cataloguer Jan.-Oct. 1889; classifier and cataloguer Y. M. C. A. Cooperstown, N. Y. July-Aug. 1890; cataloguer New York state library Oct. 1890-Sep. 1893; bibliographic work Philadelphia Nov. 1893-date.

56 **Kent, Henry Watson**. Library school 1888, attended lectures only; cataloguer Columbia university library 1884-Oct. 1886, March-Nov. 1888; librarian Peck library, Norwich (Ct.) free academy Nov. 1888-date, leave of absence in Europe Jan.-Aug. 1893.

- 57 **Lathrop, Henrietta Sprague.** Library school 1888-89.
- 58 **Loomis, Mrs Mary (Wellman).** B. A. Lenox college, Hopkinton, Ia. 1879, M. A. 1889; University of Michigan 1884-85; Library school 1888-89, 1891-92, senior certificate 1892; accession clerk New York state library Oct. 1889-July 1891; cataloguer Iowa college library, Grinnell Jan.-Aug. 1893; librarian Woman's library, World's Columbian exposition, Chicago 1893; classifier and cataloguer Free public library, Boone, Ia. June-Aug. 1894; classifier and cataloguer Free public library, Mankato, Minn. Jan. 1895; member board of directors Ladies' library association, Cherokee, Ia. Feb.-Aug. 1895; assistant University of Michigan library Oct. 1895-date; attended A. L. A. meetings 1890, '92; secretary Iowa library society 1893-94.
- 59 **Metcalf, Anna.** Library school Jan.-Ap. 1888; librarian Harris institute, Woonsocket, R. I. Oct. 1883-date, leave of absence in Europe Ap.-Oct. 1890, June-Sep. 1894; attended A. L. A. meetings 1891, '92, '93.
- 60 **Robinson, Mary.** Smith college 1881-82; Library school 1888-89.
- 61 **Sherman, Deborah Keith.** Library school 1888-89; member library committee Y. W. C. A. New York Ap. 1889-date; member committee on Institute and library of self-supporting women, Yonkers, N. Y. Dec. 1891-date, chairman cataloguing committee July 1893-date; married William Hewitt Rockwood Ap. 9, 1896; attended A. L. A. meetings 1890, '91, '92, '94.
- 62 **Sutermeister, Louise Mathilde, graduate.** Library school 1888-89, 1890-91, diploma 1891; cataloguer Wellesley college library Sep. 1891-June 1892; cataloguer Library company of Philadelphia Oct. 1892-Dec. 1894; public librarian Eau Claire, Wis. Dec. 1894-1896; married Silas Charles Delap, M. D. Dec. 24, 1896; attended A. L. A. meetings 1890, '94, '95; vice-president Wisconsin library association 1896-date.
- 63 **Temple, Mabel, graduate.** Library school 1888-90, diploma 1891; assistant Public library, North Adams, Mass. 1886-88; cataloguer Public library, Jackson, Mich. July 1890-Feb. 1891; cataloguer New York state library March-July 1891; cataloguer Colgate university library, Hamilton, N. Y. Aug. 1891-May 1892; classifier and cataloguer Crandall free library, Glens Falls, N. Y. Oct.-Nov. 1892; cataloguer Union for Christian work, Brooklyn Jan.-March 1893; classifier Brown university library July 1893-Jan. 1894, head cataloguer Oct. 1894-date; attended A. L. A. meetings 1892, '94.

*64 **Trask, Mrs Rhoda Jeanette.** Library school 1888-89, attended lectures only; public librarian, Lawrence, Kan. 15 years; died June 5, 1890.

65 **Underhill, Adelaide.** B. A. Vassar college 1888; Library school 1888-89; cataloguer Columbia university library Oct. 1889-June 1892; assistant librarian Vassar college library July 1892-date; attended A. L. A. meetings 1892, '93; vice-president New York state library school association 1896-date.

66 **Weeks, Mary Frost.** Library school 1888-89; cataloguer Union for Christian work, Brooklyn Oct. 1889-Apr. 1890, Oct. 1890-March 1891, Oct. 1891-Feb. 1892; cataloguer Bryson library, Teachers college, New York Feb.-June 1892; cataloguer Public school library, Montclair, N. J. 1892-93; public librarian Montclair, N. J. Sep. 1893-date.

67 **Winser, Beatrice.** Library school Oct. 1888; French and German cataloguer Free public library, Newark, N. J. 1889-93, assistant librarian June 1894-date; attended A. L. A. meetings 1892, '95; secretary New Jersey library association 1893-date; member New Jersey library association committee on library commission 1896-date; member New York library club committee to confer with Massachusetts library club 1896-date.

CLASS OF 1891

68 **Ball, Lucy.** Library school 1889-90; assistant librarian Public library, Grand Rapids, Mich. July 1886-Oct. 1889, first assistant librarian Sep-Oct. 1890, acting librarian Oct. 1890-Jan. 1891, librarian Jan. 1891-date; attended A. L. A. meeting 1893; treasurer Michigan library association 1891-date.

69 **Bunnell, Ada, graduate.** University of Michigan 1878-82; Library school 1889-91, B. L. S. 1891; cataloguer Lilly library, Florence, Mass. June 1890; librarian Y. W. C. A. Albany, N. Y. Sep.-Dec. 1891; classifier Free public library, Dalton, Mass. June 1893; classifier Society for the home study of Holy scripture, New York Sep. 1893; cataloguer New York state library Oct.-Nov. 1891, classifier Dec. 1891-date; attended A. L. A. meetings 1890, '93, '94, '96; attended L. A. U. K. meeting 1891.

70 **Burns, William Savage, graduate.** B. A. Yale university 1887; Library school 1889-91, B. L. S. 1891; cataloguer private library of Ira Davenport, Bath, N. Y. Aug.-Oct. 1891; librarian Michigan state normal school library, Ypsilanti Oct. 1891-June 1892; assistant on printed

catalogue A. L. A. library, World's Columbian exposition, Chicago Ap.-Dec. 1893; cataloguer New York state library Oct. 1892-June 1895; cataloguer Public documents library, Washington, D. C. July 1895-date; attended A. L. A. meetings 1893, '96.

71 **Champlin, Eva St Clair.** B. L. Alfred (N. Y.) university 1887, M. Lit. 1888; graduate scholar in English, Bryn Mawr college 1895-96; Library school Oct. 1889-Jan. 1890; first student assistant Bryn Mawr college library 1891-92; librarian Alfred university library 1888-91, 1892-93; librarian Connecticut state normal school library, New Britain 1893-94; classifier and cataloguer Public library, Addison, N. Y. July-Aug. 1894; librarian Connecticut normal schools, New Britain Sep. 1894-July 1895; lecturer on cataloguing Connecticut summer school for teachers, Norwich July 1895.

72 **Crawford, Esther.** B. L. Iowa agricultural college, Ames 1887; Library school Nov. 1889-March 1890, 1895-96; cataloguer Iowa agricultural college library Aug. 1888-Oct. 1889, March 1890-Dec. 1891; cataloguer Public library, Sioux City, Ia. July 1892-Apr. 1893, librarian May 1893-Aug. 1895; cataloguer Public library, Dayton, O. Aug. 1896-date; attended A. L. A. meetings 1893, '96.

73 **Dexter, Lydia Aurelia.** B. A. University of Chicago 1884; Library school Oct. 1889-Apr. 1891; cataloguer Newberry library, Chicago June 1891-Nov. 1895; classifier and cataloguer Public library, Camden, Me. Aug.-Sep. 1896; senior assistant the John Crerar library, Chicago Feb. 1896-date; attended A. L. A. meetings 1891, '92, '93, '94, '95; treasurer Chicago library club 1891-92, president Dec. 1894-March 1895.

74 **Fearey, Charlotte Sophia.** Library school Oct.-Dec. 1889, Feb. 1890, Oct. 1891, March-July 1892; classifier and cataloguer New York normal college alumnæ library July 1890-June 1891; cataloguer Columbia university library Nov. 1890-June 1891; classifier and cataloguer Rosemary public library, Richmond, Va. Nov. 1891-Feb. 1892; classifier and cataloguer Utica (N. Y.) state hospital medical library July-Aug. 1893, Ap. 1894; classifier and cataloguer private library of Horace E. Deming, South Woodstock, Ct. Sep. 1895; cataloguer New York state library Oct. 1892-date; attended A. L. A. meetings 1890, '92, '93, '94.

75 **Jacobs, Mary Coffin.** Library school 1889-90; public librarian Weston, Mass. Jan.-Ap. 1889; assistant librarian Harvard musical association, Boston Sep. 1895-date; attended A. L. A. meeting 1894.

76 **Kroeger, Alice Bertha, graduate.** Library school Oct. 1889-Apr. 1890, Feb.-July 1891, honor diploma 1891; assistant issue depart-

ment Public library, St Louis Ap. 1882–Sep. 1889, cataloguer Ap. 1890–Feb. 1891; librarian Drexel institute, Philadelphia Sep. 1891–date, director Library course Nov. 1892–date; attended A. L. A. meetings 1889, '92, '93; vice-president Pennsylvania library club 1895–96, member executive committee 1894–95, 1896–date.

77 **Middleton, Jennie Young**, *graduate*. Ripon (Wis.) college 1886–89; Library school 1889–91, diploma 1891; head cataloguer Free public library, Newark, N. J. May 1891–Ap. 1892, first assistant librarian Ap. 1892–May 1894; librarian Apprentices' library, Philadelphia June 1894–date; attended A. L. A. meetings 1892, '96; member Pennsylvania library club executive committee 1895–96.

78 **Plympton, Charles William**, *graduate*. Harvard university 1865–66; Library school 1889–91, honor diploma 1891; classifier Free public library, Worcester, Mass. May–Sep. 1892; accession clerk New York state library Aug. 1891–Ap. 1895, member book board Jan. 1893–Ap. 1895; attended A. L. A. meetings 1890, '94.

79 **Waldo, Celia F.** Library school Oct.–Dec. 1889; librarian Young men's association, Jackson, Mich. Oct. 1883–July 1885; public librarian Jackson, Mich. July 1885–date; attended A. L. A. meeting 1896; vice-president Michigan library association 1892–94.

80 **Whalen, Frances E.** Library school Nov. 1889; married Asahel Lovell Harvey Dec. 29, 1892.

81 **Wheeler, Martha Thorne**, *graduate*. Library school 1889–91, honor diploma 1891; indexer New York state library Sep. 1891–May 1893, member book board Jan. 1893–date, annotator New York state public libraries division June 1893–date, lecturer on indexing Library school March 1895–date; attended A. L. A. meetings 1892, '93, '94; chairman New York state library school association executive board 1895–96.

CLASS OF 1892

82 **Anderson, Edwin Hatfield**. B. A. Wabash college, Crawfordsville, Ind. 1883, M. A. 1886; Library school Oct. 1890–May 1891; librarian Y. M. C. A. Albany, N. Y. Jan.–May 1891; cataloguer Newberry library, Chicago June 1891–Ap. 1892; librarian Carnegie free library, Braddock, Pa. May 1892–March 1895; librarian Carnegie library of Pittsburgh, Ap. 1895–date; attended A. L. A. meetings 1893, '95, '96, acting treasurer A. L. A. Oct. 1895–Sep. 1896, secretary trustees' section 1896–date; chairman Western Pennsylvania library club executive committee 1896–date; president New York state library school association 1896–date.

83 **Bacon, Sophia Louise.** Library school Oct.-Dec. 1890; cataloguer Pratt institute free library, Brooklyn Jan. 1888-Aug. 1893; married Morton Voorhees Brokaw Oct. 5, 1893.

84 **Bullock, Waller Irene, graduate.** Wellesley college 1892-94; Library school 1890-91, Oct. 1894, 1895-96, diploma 1896, cataloguer Public library, Utica, N. Y. Oct. 1896-date.

85 **Burton, Bertha Bidwell.** Library school Oct. 1890-Apr. 1891; married Alexander Steele Lyman Sep. 17, 1891.

86 **Davis, Mary Louise, graduate.** Library school 1890-92, honor diploma 1892; cataloguer Colgate university library, Hamilton, N. Y. June-Sep. 1891; librarian Woman's library, World's Columbian exposition, Chicago Oct. 1893; librarian Lawson-McGhee library, Knoxville, Tenn. Sep. 1892-June 1896; head of cataloguing department Pratt institute free library, Brooklyn Sep. 1896-date; attended A. L. A. meetings 1892, '94; secretary New York state library school association 1896-date.

87 **Davis, Olin Sylvester.** Library school Jan.-June 1891; Chicago public library June-Sep. 1884; assistant executive department Columbia university library Sep. 1884-Aug. 1886; Library bureau, Boston Aug. 1886-Apr. 1887; special apprentice Public library, Providence, R. I. May-June 1887; librarian Free public library, Topeka, Kan. July 1887-May 1890; public librarian Duluth, Minn. May-Nov. 1890; librarian Y. M. C. A. Albany, N. Y. May-Aug. 1891; public librarian Lakeport, N. H. 1892-date; member New Hampshire library association executive committee 1893-94.

88 **Eastman, Rev. William Reed, graduate.** B. A. Yale university 1854, M. A. 1857; graduate Union theological seminary 1862; Library school Nov. 1890-July 1892, B. L. S. 1892; classifier Colgate university library, Hamilton, N. Y. June-Oct. 1891; classifier and reviser Public library, Athol, Mass. Feb.-March 1892; inspector New York state public libraries division Aug. 1892-date, member book board New York state library Jan. 1896-date, instructor in library buildings Library school Oct. 1895-date; attended A. L. A. meetings 1892, '94, '95, '96; secretary New York state library association 1893-date; chairman New York state library school association executive board 1896-date.

89 **Ellis, Mary, graduate.** Library school 1890-92, diploma 1892; classifier and cataloguer Public library, Springfield, Vt. Aug.-Sep. 1892; cataloguer Crandall free library, Glens Falls, N. Y. Oct.-Dec. 1892; cataloguer Vermont academy library, Saxtons River May-June 1893; indexer New York state commission in lunacy, Albany Jan.-Apr. Sep.-Oct. 1893; classifier Public library, New Rochelle, N. Y. Nov. 1893; classi-

fier Public library, Springville, N. Y. Dec. 1893; classifier and cataloguer Public library, North Tonawanda, N. Y. March 2-19, 1894; classifier Union school library, East Aurora, N. Y. March 19-Apr. 2, 1894; classifier Literary and historical society, Belmont, N. Y. April 3-7, 1894; classifier Albany (N. Y.) free library Oct. 1894; classifier and cataloguer Oswego (N. Y.) state normal school library Nov. 1894; classifier and cataloguer private library of Hon. Levi K. Fuller, Brattleborough, Vt. March-Apr. 1895; classifier and cataloguer Jarvis library, Rome, N. Y. May-July 1895; classifier and cataloguer Roxbury (N. Y.) library Sep. 1895; librarian Y. W. C. A. Albany, N. Y. Oct.-Nov. 1895; cataloguer New York state public libraries division Jan. 1894-Sep. 1895, indexer Oct. 1895-date; attended A. L. A. meetings 1892, '94.

90 **Foote, Elizabeth Louisa**, *graduate*. B. A. Syracuse university 1888; Library school Jan. 1890-July 1892, B. L. S. 1892; classifier and cataloguer Central library, Rochester, N. Y. July-Sep. 1892; classifier and cataloguer Ilion (N. Y.) free library Aug. 1893; classifier and cataloguer Public library, Saugerties, N. Y. Sep. 1894; assistant New York state public libraries division Dec. 1892-Oct. 1894, cataloguer New York state library July 1892, Nov. 1894-Feb. 1895; classifier and cataloguer Herkimer (N. Y.) free library Nov. 1895-Feb. 1896; cataloguer Colgate university library, Hamilton, N. Y. June-Oct. 1891, cataloguer Baptist historical collection July-Aug. 1894, March-July 1895, Ap.-June 1896; classifier and cataloguer Wood library, Canandaigua, N. Y. July 1896; classifier and cataloguer Public library, Dansville, N. Y. Oct. 1896; attended A. L. A. meetings 1892, '93, '94.

91 **Jones, Mary Letitia**, *graduate*. B. L. University of Nebraska 1885; Library school Jan. 1891-July 1892, B. L. S. 1892; assistant librarian University of Nebraska Sep. 1892-Apr. 1896, acting librarian Ap. 1896-date, adjunct professor of bibliography Ap. 1895-date; attended A. L. A. meetings 1892, '93, '95, '96; president Nebraska state library association 1895, secretary 1896-date; member New York state library school association executive board 1894-95.

*92 **Macky, Bessie Rutherford**, *graduate*. B. A. Wellesley college 1889; Library school 1890-92, B. L. S. 1892; assistant librarian Diocesan lending library, Cathedral of all saints, Albany, N. Y. 1890-92; assistant librarian Drexel institute, Philadelphia Sep. 1892-Nov. 1895, instructor Library course Nov. 1892-Nov. 1895; attended A. L. A. meetings 1892, '93; secretary Pennsylvania library club 1893-94; died Ap. 4, 1896.

93 **Peirce, Mary Emma**. Library school 1890-91.

94 **Robbins, Mary Esther**, *graduate*. Library school 1890-92, diploma 1892; classifier and cataloguer David M. Hunt library, Falls Village, Ct. Aug.-Sep. 1891; librarian Y. W. C. A. Albany, N. Y. Dec. 1890-July 1892; librarian New Britain (Ct.) institute Sep. 1892-Sep. 1894; cataloguer University of Nebraska library Nov. 1894-July 1896; attended A. L. A. meetings 1892, '93, '95; treasurer New York state library school association 1894-95.

95 **Rockwell, Anna Gaylord**. Library school 1890-91, honor senior certificate 1891; librarian Aguilar free library, New York Sep. 1891-Sep. 1892; cataloguer Otis library, Norwich, Ct. Oct. 1892-Oct. 1893; cataloguer Stevens memorial library, Attica, N. Y. Nov. 1893-March 1894; classifier and cataloguer Bradley library, North Haven, Ct. Aug. 1894; librarian New Britain (Ct.) institute Sep. 1894-date; attended A. L. A. meeting 1890.

96 **Sharp, Katharine Lucinda**, *graduate*. Ph. B. Northwestern university 1885, Ph. M. 1889; Library school 1890-92, B. L. S. 1892; assistant librarian Scoville institute, Oak Park, Ill. Oct. 1888-Sep. 1890; classifier and cataloguer Adams memorial library, Wheaton, Ill. July-Oct. 1891; classifier and cataloguer Library association, Xenia, O. Aug.-Oct. 1892; in charge Comparative library exhibit prepared by Library school for World's Columbian exposition, Chicago Nov. 1892-Oct. 1893; librarian Armour institute of technology, Chicago, and director Department of library economy Jan. 1893-date; director Wisconsin summer school of library science, University of Wisconsin, Madison July 1895-date; extension lecturer on library economy, University of Chicago Dec. 1896-date; attended A. L. A. meetings 1892, '93, '94, '95, member A. L. A. cooperation committee 1893-94, 1895-96, member A. L. A. council 1895-date; director Illinois state library association bureau of information 1896-date; member committee on Illinois state library commission 1896-date; member Chicago library club lecture committee 1893-94, first vice-president 1895-96; president New York state library school association 1894-95.

97 **Taylor, Elizabeth King**. Library school Oct. 1890-Apr. 1892; married Clifford E. White June 28, 1892.

98 **Walker, Harriet Ann**. Graduate Mt Holyoke seminary 1870; Library school Oct. 1890-May 1892; librarian Olive church library, New York 1884-90, May - Aug. 1892; curator botanical library, Wellesley college Sep. 1892-date; attended A. L. A. meetings 1890, '96.

99 **Watkins, Evelyn Mary.** Library school Oct. 1890–March 1892, senior certificate 1892; cataloguer Woman's library, World's Columbian exposition, Chicago May–Sep. 1893; assistant cataloguer Woman's library, Chicago May–July 1894.

100 **Wetzell, Bertha Seidl.** Library school Oct.–Dec. 1890; cataloguer Thomas Beaver library, Danville, Pa. May 1888–Nov. 1891; cataloguer Public library, Scranton, Pa. Dec. 1891–Oct. 1894; assistant in charge reference desk and circulating department, Free library of Philadelphia Ap. 1895–date; attended A. L. A. meeting 1894.

CLASS OF 1893

101 **Baker, Bessie.** B. S. Purdue university, Lafayette, Ind. 1886; Library school 1891–92; classifier and cataloguer Clinton liberal institute, Fort Plain, N. Y. July–Aug. 1892; librarian Y. W. C. A. Albany, N. Y. Nov. 1892–Ap. 1893; cataloguer A. L. A. library, World's Columbian exposition, Chicago Nov. 1892–Ap. 1893; cataloguer Armour institute of technology, Chicago June–Sep. 1893; assistant librarian Bryn Mawr college library Sep. 1893–Aug. 1896; attended A. L. A. meetings 1892, '93.

102 **Christman, Jenny Lind, graduate.** B. S. Iowa agricultural college, Ames 1883; Library school Oct. 1891–May 1893, 1894–95, B. L. S. 1895; cataloguer Public library, Helena, Mont. June 1893–July 1894; cataloguer Library bureau, Boston Feb. 1895; classifier and cataloguer Public library, Nahant, Mass. July–Sep. 1895; cataloguer New York state library Oct. 1894–date; attended A. L. A. meeting 1892.

103 **Church, Henrietta, graduate.** Library school March–June 1891, Oct. 1891–June 1892, 1893–94, diploma 1894; cataloguer Dean Sage collection on angling, Albany, N. Y. July–Nov. 1892; cataloguer A. L. A. library, World's Columbian exposition, Chicago Nov. 1892–July 1893; cataloguer New York state library Jan.–March 1894; librarian Young men's association, Albany, N. Y. Ap. 1894–June 1895; assistant librarian and head cataloguer Public library, Utica, N. Y. Nov. 1895–date; attended A. L. A. meeting 1896.

104 **Clark, Don Linnæus.** University of Nebraska 1880–Dec. 1883; Library school Jan.–Dec. 1892; attended A. L. A. meeting 1892.

105 **Fairbanks, Mittie Belcher.** Library school 1891–92; Amherst summer school of library economy July–Sep. 1893; assistant Bowdoin college library Ap.–July 1893, June 1894; assistant Maine state library, Augusta Jan.–Feb. 1896; genealogical research 1893–date; attended A. L. A. meeting 1892.

106 Forsyth, Walter Greenwood, graduate. B. A. Harvard university 1888; Library school 1891-93, diploma 1895; classifier and cataloguer private library of Mrs J. V. L. Pruyn, Albany, N. Y. May-Oct. 1893; special cataloguer Free public library, Worcester, Mass. Nov.-Dec. 1893; classifier and cataloguer private library of Rt Rev. William Croswell Doane, Albany, N. Y. Feb.-June 1894; reference librarian Library company of Philadelphia Oct. 1894-Oct. 1895; attended A. L. A. meetings 1892, '94.

107 Harrison, Joseph Le Roy, graduate. Cornell university 1882-85; University of Heidelberg 1890; Library school 1891-93, B. L. S. 1893; librarian North Adams (Mass.) library association June 1881-Sep. 1882; sub-librarian (legislation) New York state library Oct. 1893-Sep. 1894; non-resident lecturer on library legislation in the United States, Library school June 1896-date; librarian Providence (R. I.) Athenæum Oct. 1894-date; attended A. L. A. meetings 1892, '93, '94, '96, member A. L. A. cooperation committee 1894-95; president New York state library school association 1895-96.

108 Hawley, Mary Elizabeth, graduate. Library school 1891-93, diploma 1893; classifier Peabody institute, Danvers, Mass. Nov.-Dec. 1892; cataloguer Pratt institute free library, Brooklyn Ap. 1893; classifier and cataloguer Syracuse (N. Y.) central library June-Oct. 1894; cataloguer New York state library Oct. 1893-date, instructor in German Library school Oct. 1893-Nov. 1894, assistant instructor in elementary cataloguing Oct. 1896-date; attended A. L. A. meetings 1892, '93, '94, '96.

109 Hulbert, Nellie May. Graduate Oberlin college Sep. 1886-Dec. 1888; Bryn Mawr college 1890-91; Library school 1891-92, senior certificate 1892; cataloguer A. L. A. library, World's Columbian exposition, Chicago Oct.-Nov. 1892; cataloguer Oberlin college library Ap. 1893-March 1896; married Dr George C. Jameson Dec. 28, 1893; attended A. L. A. meeting 1892.

110 Lapham, Alice Maud. Smith college 1885-86; University of Michigan 1886-87, Feb. 1893-June 1894; Library school, 1891-92, honor senior certificate 1892; attended A. L. A. meeting 1892.

111 Lindsay, Mary Boyden. Library school Oct. 1891-Apr. 1892; cataloguer Woman's library, World's Columbian exposition, Chicago May-Sep. 1893; cataloguer Public library, Peoria, Ill. Ap. 1888-May 1894; public librarian Evanston, Ill. June 1894-date; attended A. L. A. meetings 1893, '96; second vice-president Chicago library club Dec. 1894-March 1895, first vice-president Oct. 1896-date.

112 Lounsbury, Henrietta. Library school 1891-92; cataloguer private library of George Jackson Fisher, M. D. Sing Sing, N. Y. March-

May 1893; indexer and cataloguer Binghamton (N. Y.) state hospital Dec. 1893–Ap. 1894; indexer, cataloguer and teacher Hudson river state hospital, Poughkeepsie, N. Y. May 1894–date; attended A. L. A. meeting 1892.

113 Marshall, Alice May. Library school Oct.–Nov. 1891; assistant librarian Perkins institution for the blind, South Boston, Mass. July 1892–June 1895.

114 Payne, May. Library school Oct.–Dec. 1891; classifier Elliott library, Nashville, Tenn. June 1895; librarian Ladies' reading and reception room, Monteagle, Tenn. July–Aug. 1896; first assistant University of Nashville (Tenn.) library 1888–date; member Tennessee centennial exposition library committee of woman's board, Nashville 1896–date.

115 Rathbone, Josephine Adams, graduate. Wellesley college 1882–83; University of Michigan 1890–91; Library school 1891–93, B.L.S. 1893; assistant librarian Diocesan lending library, Cathedral of all saints, Albany, N. Y. Oct. 1892–June 1893; first assistant cataloguing department Pratt institute free library, Brooklyn Sep. 1893–date, instructor Library school of Pratt institute Oct. 1893–June 1895, assistant in charge July 1895–date; attended A. L. A. meetings 1892, '93, '94, '95, '96; secretary New York library club 1895–date; secretary New York state library school association 1895–96.

***116 Reynolds, Rose Ewell.** Library school Oct. 1891–Ap. 1892; assistant Public library, Peoria, Ill. Ap. 1888–Oct. 1891, cataloguer Ap. 1892–Sep. 1893; died Sep. 10, 1893.

117 Rice, Helen Ware, graduate. Library school 1891–93, diploma 1893; cataloguer Boston Athenæum Oct. 1893–Nov. 1894; cataloguer University of Virginia library, Charlottesville, Va. Nov. 1894–Aug. 1895; cataloguer Horticultural society library, Worcester, Mass. Dec. 1895–date; cataloguer Bangs library, First unitarian church, Worcester, Mass. Jan. 1896–date; attended A. L. A. meeting 1893.

118 Rogers, Kittie Childs. Library school Oct.–Nov. 1891.

119 Sheldon, Helen Griswold, graduate. B. A. Vassar college 1891; Library school 1891–93, diploma 1893; classifier and cataloguer Miss Masters' school library, Dobbs Ferry, N. Y. June 1894; librarian Tome institute, Port Deposit, Md. July 1894–July 1896; assistant librarian Drexel institute, Philadelphia Sep. 1896–date, instructor Library course Oct. 1896–date; attended A. L. A. meetings 1892, '93, '94, '95, '96.

120 Smith, May Frances. Library school Oct.–Dec. 1891; cataloguer Colgate university library, Hamilton, N. Y. Aug. 1891–July 1894, assistant librarian and cataloguer Aug. 1894–date.

121 Sutliff, Mary Louisa, graduate. Library school 1891-95, diploma 1895; assistant shelflister New York state library Oct. 1891-Jan. 1892, shelflister Feb. 1892-Sep. 1896, cataloguer Oct. 1896-date; attended A. L. A. meeting 1892.

122 Van Hoevenberg, Alma Rogers. Library school of Pratt institute July-Oct. 1891; Amherst summer school of library economy Aug 1892; Library school 1891-92, Oct.-Dec. 1894; apprentice Pratt institute free library, Brooklyn July-Oct. 1891; public librarian South Orange, N. J. Aug. 1892-Sep. 1894; indexer New York genealogical record, New York Sep. 1894; assistant classifier Albany (N. Y.) free library Oct. 1894; classifier and cataloguer Free public library, Waverly, N. Y. Jan. 1895; classifier and cataloguer Public library, Nahant, Mass. Feb.-July 1895; assistant librarian Washington Heights free library, New York Aug. 1895-date; attended A. L. A. meeting 1892.

123 Wilson, James Meredith. Ph. B. Cornell university 1880; M. D. Rush medical college 1882; Library school Oct. 1891-March 1892, attended lectures only; assistant Newberry library, Chicago Ap. 1892-Sep. 1894; attended A. L. A. meeting 1893.

CLASS OF 1894

124 Bennett, May Louise. B. A. Northwestern university 1891; Library school 1892-93, senior certificate 1893; assistant librarian Arnour institute of technology, Chicago Aug. 1893-Aug. 1896; instructor in cataloguing Department of library economy Sep. 1893-Aug. 1896; attended A. L. A. meeting 1893; secretary Chicago library club 1895-date; member New York state library school association executive board 1894-95.

125 Bullock, Edna Dean, graduate. B. L. University of Nebraska 1889; Library school 1892-93, 1894-95, diploma 1895; cataloguer University of Nebraska library Ap. - Oct. 1894; classifier and cataloguer Y. M. C. A. Jamestown, N. Y. July 1895; classifier and cataloguer Western New York institution for deaf mutes, Rochester Aug. 1895; classifier and cataloguer Worcester (Mass.) polytechnic institute Sep. - Dec. 1895; classifier and cataloguer Nebraska state library, Lincoln Dec. 1895-July 1896; attended A. L. A. meetings 1893, '94; first vice-president Nebraska state library association 1896-date.

126 Dean, Rev. Leonard J. B. A. Colgate university 1871, M. A. 1874; graduate Newton (Mass.) theological institution 1874; Library school Oct. 1892-Feb. 1893.

127 **De Long, Annie.** Library school 1892-93, senior certificate 1893; assistant librarian Crandall free library, Glens Falls, N. Y. July 1893-May 1895, librarian June 1895-date.

128 **Denio, Herbert Williams, graduate.** B. A. Middlebury (Vt.) college 1888, M. A. 1891; Library school 1892-94, diploma 1894; librarian Y. M. C. A. Albany, N. Y. June 1893; classifier and cataloguer Sherman free library, Port Henry, N. Y. Sep.-Oct. 1893, Jan. 1894; classifier and cataloguer private library of Rt Rev. William Croswell Doane, Albany, N. Y. Oct.-Nov. 1894; cataloguer law library of Marcus T. Hun, Albany, N. Y. Jan.-Feb. 1895; classifier and cataloguer Kellogg-Hubbard library, Montpelier, Vt. Oct. 1895-Jan. 1896; classifier and cataloguer Free library and reading room, Warren, Pa. March-June 1896; copied for New York state comptroller Index of New York revolutionary records in Record and pension office. War department, Washington, D. C. Oct. 1896; classifier and cataloguer McGill university library, Montreal Nov. 1896-date; assistant New York state library Aug. 1894-date; attended A. L. A. meeting 1894.

129 **Ellis, Elizabeth Tisdale.** Library school 1892-93, Jan.-March 1896; classifier and cataloguer Public library, Wenona, Ill. Oct. 1896; assistant Public library, Peoria, Ill. Oct. 1891-Oct. 1892, cataloguer Aug. 1893-May 1894, head cataloguer May 1894-date, in charge of reference department Oct. 1896-date; attended A. L. A. meeting 1893.

130 **Gibson, Irene.** Library school 1892-93, senior certificate 1893; cataloguer Armour institute of technology, Chicago Aug. 1893; assistant issue department Public library, Detroit Feb. 1887-Oct. 1892, Oct. 1893-March 1894; cataloguer Public library, St Louis Ap. 1894-March 1896; cataloguer Public documents library, Washington, D. C. Ap. 1896-date; attended A. L. A. meeting 1893; first vice-president New York state library school association 1895-96.

131 **Gleason, Hiram North Ernest.** University of Michigan 1887-91; Library school Oct. 1892-Jan. 1893.

132 **Hawes, Clara Sikes, graduate.** Library school 1892-94, diploma 1894; classifier and cataloguer Young men's library association, Palmer, Mass. July-Oct. 1894; classifier and cataloguer Town library, Dover, Mass. Nov. 1894; cataloguer Library company of Philadelphia Dec. 1894-date; attended A. L. A. meetings 1893, '94.

133 **Ludington, Harriet Estelle.** Library school Oct.-Dec. 1892.

134 **McCreary, Nellie.** Swarthmore college 1891-92; Library school Oct. 1892-March 1894; assistant librarian Diocesan lending library, Cathedral of all saints, Albany, N. Y. Oct. 1893-March 1894;

cataloguer Public library, St Louis Ap. 1894–Nov. 1896; married Joseph Walter De Laughter Dec. 2, 1896; attended A. L. A. meeting 1895.

135 Moulton, John Grant. B. A. Harvard university 1892; Library school Oct. 1892–June 1894, senior certificate 1893; indexer New York state commission in lunacy, Albany May 1893–Jan. 1894; public librarian Quincy, Ill. July 1894–date; attended A. L. A. meetings 1893, '96.

136 Sewall, Willis Fuller. B. A. Tufts college 1890; Library school 1892–93, senior certificate 1893; assistant librarian Tufts college library 1890–92, reference librarian March–May 1894; indexer New York state commission in lunacy, Albany May 1893–Feb. 1894; cataloguer Sauppe collection Bryn Mawr college library June 1894–June 1895; acting librarian Wilmington (Del.) institute free library Sep.–Nov. 1895, librarian Dec. 1895–date; attended A. L. A. meeting 1896.

137 Sperry, Helen, graduate. Library school 1892–93, Dec. 1893–June 1894, honor diploma 1894; assistant librarian Silas Bronson library, Waterbury, Ct. Oct. 1883–Sep. 1892, July–Nov. 1893; assistant New York state library Dec. 1893–June 1894; first assistant Carnegie free library, Braddock, Pa. Aug. 1894–March 1895, librarian Ap. 1895–date; attended A. L. A. meetings 1885, '87, '96; member Western Pennsylvania library club executive committee 1896–date; member New York library school association executive board 1896–date.

***138 Vandersluis, Daniel Oswald.** B. A. University of Michigan 1890; Library school Oct. 1892–Jan. 1893; died March 10, 1894.

CLASS OF 1895

139 Avery, Myrtilla, graduate. B. A. Wellesley college 1891; Library school 1893–96, B. L. S. 1896; director's assistant New York state public libraries division Nov. 1894–date, assistant in charge Summer session New York state library school (N. Y.) July–Aug. 1896; attended A. L. A. meeting 1894.

140 Barnett, Claribel Ruth. Ph. B. University of Michigan 1893; Library school Oct. 1893–May 1894, Oct. 1894–May 1895; classifier and cataloguer Troy (N. Y.) children's neighborhood library Feb. 1895; cataloguer Department of agriculture library, Washington, D. C. May 1895–date.

141 Blakely, Bertha Eliza. B. L. Mt Holyoke college 1893; Library school 1893–94, honor senior certificate 1894; librarian New Jersey state normal school, Trenton Sep. 1894–June 1895; assistant librarian Mt Holyoke college Sep. 1895–date.

142 Bowerman, George Franklin, graduate. B. A. University of Rochester 1892; Library school 1893–95, B. L. S. 1895; cataloguer

New York state library Jan. 1894–Ap. 1895; reference librarian Reynolds library, Rochester, N. Y. Aug. 1895–July 1896; attended A. L. A. meetings 1894, '96.

143 **Briggs, Mary Josephine.** Graduate Oberlin college 1880, B. L. 1894; Library school 1893–94, honor senior certificate 1894; librarian Y. W. C. A. Albany, N. Y. Nov. 1893–July 1894; special cataloguer Free public library, Worcester, Mass. Sep. 1894–date; attended A. L. A. meeting 1896.

144 **Champlin, George Greenman, graduate.** Ph. B. Alfred (N. Y.) university 1884, Ph. M. 1890; Library school 1893–95, diploma 1895; cataloguer New York state library Aug. 1894–July 1895; assistant Library bureau, Boston Aug. 1895–Ap. 1896; indexer and cataloguer New York state board of health bureau of vital statistics, Albany Ap. 1896–date; attended A. L. A. meeting 1894.

145 **Cone, Jessica Gardiner.** Library school 1893–95, senior certificate 1896; attended A. L. A. meeting 1894.

146 **English, Stephanie Pauline.** Newnham college, Cambridge university, historical tripos 1893; Library school Oct. 1893–Ap. 1894; assistant Public library, Edinburgh, Scotland July–Aug. 1894; attended L. A. U. K. meeting 1894.

147 **Gay, Helen Kilduff.** Library school 1893–95; cataloguer private library of Rt Rev. William Croswell Doane, Albany, N. Y. Oct.–Nov. 1894; librarian Y. W. C. A. Albany, N. Y. Oct. 1894–June 1895; cataloguer Public documents library, Washington, D. C. July 1895–March 1896; public librarian Mount Vernon, N. Y. March 1896–date.

148 **Hawks, Emma Beatrice.** B. A. Smith college 1892; Library school Oct. 1893–Ap. 1894; assistant Forbes library, Northampton, Mass. Oct. 1894–May 1895; cataloguer Department of agriculture library, Washington, D. C. June 1895–date.

149 **Josephson, Aksel Gustav Salomon.** Library school Oct. 1893–March 1894; librarian Verdandis arbetarebibliotek, Uppsala, Sweden May 1892–Feb. 1893; bibliographic work *Publishers' weekly* office, New York Ap.–June 1894; cataloguer Public library, New York July 1894–Feb. 1896; cataloguer the John Crerar library, Chicago March 1896–date.

150 **Leonard, Grace Fisher, graduate.** Brown university Jan.–June 1893; Library school 1893–95, honor diploma 1895; classifier and cataloguer Union school library, Sandy Hill, N. Y. Nov. 1894; classifier and cataloguer Public library, Waterford, N. Y. Feb. 1895; classifier and

cataloguer Public library, Auburn, R. I. July–Aug. 1895; classifier and cataloguer Rhode Island school of design library, Providence June–Sep. 1896; classifier and cataloguer Providence (R. I.) Athenæum Oct. 1895–date; attended A. L. A. meeting 1896; second vice-president New York state library school association 1896–date.

151 **Loveland, Elizabeth Shepard.** Library school 1893–95, senior certificate 1894; classifier and cataloguer Young women's association library, Troy, N. Y. Jan. 1895.

152 **McGuffey, Margaret Drake.** Library school Oct. 1893–Ap. 1895, senior certificate 1894; classifier and cataloguer Young women's association library, Troy, N. Y. Jan. 1895; chief of issue department Public library, Boston May 1895–date; attended A. L. A. meeting 1894.

153 **Newman, Alice.** B. S. Wellesley college 1893; Library school Oct. 1893–Jan. 1894, 1895–date; librarian Y. W. C. A. Albany, N. Y. Nov. 1895–June 1896; assistant New York state library Aug. 1896–date.

154 **Silliman, Helen Cornwell, graduate.** Library school 1893–95, diploma 1895; cataloguer Colgate university library, Hamilton, N. Y. July–Aug. 1894; cataloguer Public library, Saugerties, N. Y. Oct. 1894; cataloguer Public documents library, Washington, D. C. July 1895–date.

155 **Stanley, Harriet Howard, graduate.** Library school 1893–May 1895, honor diploma 1895; classifier and cataloguer Union school library, Saratoga Springs, N. Y. July 1894; public librarian Southbridge, Mass. May 1895–date; attended A. L. A. meeting 1896.

156 **Stockwell, George Watson Cutler.** Library school 1893–95, honor senior certificate 1894; assistant librarian Diocesan lending library, Cathedral of all saints, Albany, N. Y. March 1894–June 1895; cataloguer Public library, Concord, N. H. July 1895–June 1896.

157 **Sutliff, Jennie Sweet.** University of Kansas 1881–85; Library school Oct. 1893–Ap. 1894; attended A. L. A. meeting 1895.

158 **Watson, William Richard.** B. S. Carleton college, Northfield, Minn. 1890; Library school Oct. 1893–Ap. 1895, senior certificate 1894; assistant librarian Carnegie library of Pittsburgh, May 1895–date; attended A. L. A. meeting 1894; secretary and treasurer Western Pennsylvania library club Sep. 1896–date.

159 **Wilson, Minnie Cornwell, graduate.** Library school 1893–95, honor diploma 1895; classifier and cataloguer Union school library, Sandy Hill, N. Y. Nov. 1894; classifier and cataloguer Public library,

Waterford, N. Y. Feb. 1895 ; assistant classifier private library of Hon. Levi K. Fuller, Brattleborough, Vt. March 1895.

CLASS OF 1896

160 **Ames, Sarah Hewes.** Library school 1894-95 ; classifier and cataloguer Public library, Niagara Falls, N. Y. July-Aug. 1895 ; classifier and cataloguer Public library, Stoneham, Mass. Sep.-Nov. 1895 ; classifier and cataloguer Public library, Wheeling, W. Va. Jan.-Ap. 1896 ; cataloguer Harvard divinity school library May 1896-date.

161 **Betteridge, Grace Lillian.** Wellesley college 1887-89 ; Library school 1894-date ; assistant New York state public libraries division Dec. 1894-date.

162 **Biscoe, Ellen Dodge, graduate.** Wellesley college 1885-88 ; Library school 1894-96, diploma 1896 ; classifier and cataloguer Public library, Niagara Falls, N. Y. July-Aug. 1895 ; assistant New York state library Oct. 1895-June 1896 ; classifier and cataloguer Buffalo historical society library July-Dec. 1896 ; public librarian Eau Claire, Wis. Dec. 1896-date.

163 **Brooks, Henrietta St Barbe.** B. S. Wellesley college 1891 ; Library school Oct. 1894-Apr. 1895 ; cataloguer Harvard university library May 1893-June 1894 ; volunteer cataloguer Goodnow library, Sudbury, Mass. Aug.-Sep. 1894 ; chief cataloguer Carnegie library of Pittsburgh May 1895-date ; attended A. L. A. meeting 1896.

164 **Corwin, Euphemia Kipp.** Mt Holyoke seminary 1881-82 ; Library school Oct. 1894-May 1896, senior certificate 1895 ; cataloguer Public library, Utica, N. Y. Oct. 1896-date.

165 **Curtis, Florence Rising.** Wells college 1891-94 ; Library school 1894-96 ; classifier and cataloguer Troy (N. Y.) children's neighborhood library Feb. 1895 ; assistant librarian Diocesan lending library, Cathedral of all saints, Albany, N. Y. Nov. 1895-June 1896 ; assistant Osterhout free library, Wilkes-Barré, Pa. July 1896-date.

166 **Edwards, Ella May.** Syracuse university 1887-88 ; Library school 1894-95 ; cataloguer Worcester (Mass) club library July 1895 ; cataloguer Free public library, Worcester, Mass. June 1895-Oct. 1896 ; classifier and cataloguer Public library, Athol, Mass. Oct. 1896 ; cataloguer Worcester (Mass.) polytechnic institute Nov. 1896 ; indexer Rural cemetery, Worcester, Mass. Oct.-Dec. 1896 ; classifier and cataloguer Buffalo historical society library Dec. 1896-date.

167 **Hale, Elizabeth Vashti.** Library school 1894-95 ; substitute librarian Peck library, Norwich (Ct.) free academy Oct.-Dec. 1895 ; assistant librarian Drexel institute, Philadelphia, and instructor Library

course Jan.-June 1896; classifier and cataloguer private library of Gov. Levi P. Morton, Ellerslie, N. Y. July 1896; librarian and treasurer Elizabethtown (N. Y.) circulating library 1886-date; classifier and cataloguer private and school library of Miss Sarah Porter, Farmington, Ct. Nov. 1896-date.

168 **Herron, Winifred Arria.** Boston university 1892-93; Library school 1894-95; classifier and cataloguer, Public library, Nantasket, Mass. Nov. 1895; classifier and cataloguer Public library, Newburyport, Mass. May 1896-date.

169 **Hosford, James Frederic.** B. A. Princeton university 1892; studied library economy with Dr E. C. Richardson, librarian Princeton university 1893-94; Library school Oct.-Nov. 1894.

170 **Hoyt, Maude Buckingham.** Library school Nov. 1894-June 1895.

171 **Keating, Geraldine Katherine.** Library school 1894-95; assistant cataloguer private library of Hon. Levi K. Fuller, Brattleborough, Vt. Ap. 1895; public librarian Rockville, Ct. Feb. 1896-date; attended A. L. A. meeting 1894.

172 **Latty, Clara Emily.** Swarthmore college March-June 1881; Library school Oct. 1894-May 1895.

173 **Mattocks, Jessie Potter.** Library school 1894-95; married Walter Howard Talbot Sep. 24, 1896.

174 **Olcott, Frances Jenkins, graduate.** Library school 1894-96, diploma 1896.

175 **Pond, Nancy May, graduate.** B. S. Wellesley college 1893; Library school 1894-96, B. L. S. 1896; assistant librarian Harris institute, Woonsocket, R. I. Jan.-Sep. 1894; substitute librarian Peck library, Norwich (Ct.) free academy Sep. 1896-date.

176 **Seymour, Martha Louise.** B. A. McGill university, Montreal 1893; Library school Oct. 1894-May 1895; married Chadwick Philander Cummings Oct. 28, 1896.

177 **Wait, Marie Fox.** Vassar college 1872-74; Library school 1894-95; classifier and cataloguer Free library, Ellenville, N. Y. July-Oct. 1893; substitute librarian Y. W. C. A. New York July 1895; classifier and cataloguer Public library, Oneonta, N. Y. Nov.-Dec. 1895; cataloguer Public library, New York Feb. 1896-date.

178 **Willard, Elisa May.** B. A. Smith college 1894; Library school 1894-95, honor senior certificate 1895; public librarian, Montpelier, Vt. July-Sep. 1895; instructor in cataloguing Summer session

New York state library school July-Aug. 1896; reference librarian Carnegie library of Pittsburgh, Sep. 1895-date; attended A. L. A. meeting 1896; member Western Pennsylvania library club executive committee Sep. 1896-date.

CLASS OF 1897

179 **Abbot, Etheldred.** B. A. Vassar college 1895; Library school 1895-date, senior certificate 1896; assistant Vassar college library Sep. 1893-June 1895; cataloguer Public library, Hartford, Ct. July-Aug. 1896.

180 **Ames, Anne Seymour.** Library school 1895-date, honor senior certificate 1896.

181 **Andrews, Elisabeth Parkhill.** Library school 1895-date, honor senior certificate 1896; public librarian Wethersfield, Ct. July 1894-Sep. 1895, July-Sep. 1896.

182 **Atkinson, Jane.** B. A. Swarthmore college 1893; Library school 1895-96.

183 **Fellows, Jennie Dorcas.** Library school, 1895-date, honor senior certificate 1896; assistant Peck library, Norwich (Ct.) free academy, Sep. 1892-Sep. 1895; cataloguer private library of Albert Vander Veer, M. D. Albany, N. Y. May-Nov. 1896; attended A. L. A. meeting 1896.

184 **Flagg, Charles Allcott.** B. A. Bowdoin college 1894; Library school 1895-date, honor senior certificate 1896; assistant Bowdoin college library Sep. 1891-June 1894; cataloguer Diocesan lending library, Cathedral of all saints, Albany, N. Y. June 1896-date; assistant New York state library July 1896-date.

185 **Frisbee, Rev. Edward Selah.** B. A. Amherst college 1860, M. A. 1866, D. D. 1878; Library school 1895-96.

186 **Hopkins, Julia Anna.** Library school 1895-96, senior certificate 1896; reference librarian Reynolds library, Rochester, N. Y. Sep. 1896-date.

187 **Iles, Constance Hurford.** B. L. Smith college 1895; Library school Oct. 1895.

188 **Kueffner, Cecilia Wanda.** University of Michigan 1892-93; Radcliffe college 1893-94; Library school 1895-96; volunteer assistant Public library, Denver, Col. July-Sep. 1892; cataloguer special collection University of Michigan library 1892-93; assistant Boston Athenæum July-Sep. 1894.

189 **Langworthy, Louise.** Ph. B. Alfred (N. Y.) university 1895; Library school 1895-date.

190 **Lord, Isabel Ely.** Library school 1895-date, honor senior certificate 1896; classifier and cataloguer Public school library, Albany, N. Y. Ap-June 1896; assistant New York state library July 1896-date; attended A. L. A. meeting 1896.

191 **McNair, Mary Wilson.** B. A. Elmira college 1895; Library school 1895-96; classifier and cataloguer Public library, Ansonia, Ct. Sep. 1896; cataloguer Public library, New York Oct. 1896-date.

192 **Morse, Anna Louise.** B. A. Smith college 1892; Library school Oct. 1895-Jan. 1896, Oct. 1896-date; assistant librarian Town library, Millbury, Mass. June-Aug. 1895, librarian Sep. 1895.

193 **Pierson, Harriet Wheeler.** Mt Holyoke college 1892-94; Library school 1895-96; classifier and cataloguer Public library, Ansonia, Ct. Sep. 1896; cataloguer Public library, New York Oct. 1896-date.

194 **Smith, Bessie Sargeant.** B. A. Wellesley college 1895; Library school 1895-date.

195 **Terwilliger, Mary Sayers.** Ph. B. Alfred (N. Y.) university 1890, Ph. M. 1892; Library school 1895-date.

96 **Thompson, Madeline Sylvester.** B. S. Cornell university 1882; Library school Oct. 1895-Nov. 1896, senior certificate 1896; classifier and cataloguer Public library, Arlington, R. I. Sep. 1896; cataloguer Public library, New York Nov. 1896-date.

197 **Thorne, Elisabeth Gertrude.** B. A. Vassar college 1895; Library school 1895-date; assistant loan department, Vassar college library Sep. 1894-June 1895.

198 **Waterman, Lucy Dwight.** Library school 1895-date; librarian College settlement, Rivington st. New York July-Aug. 1896.

199 **Willard, Julia Etta.** B. L. Cornell university 1885; Library school Oct. 1895-May 1896.

CLASS OF 1898

200 **Bailey, Arthur Low.** Tufts college 1894-96; Library school 1896-date.

201 **Brown, Edna Adelaide.** Brown university 1894-96; Library school 1896-date; assistant Public library. Providence, R. I. March-July 1895.

202 **Cook, William Burt, jr.** B. A. Cornell university 1896; Library school 1896-date.

203 **De Puy, Almena Rebecca.** University of Michigan 1888-89; Library school 1896-date; substitute Public library, Jackson, Mich. July-Dec. 1892.

204 **Garvin, Ethel.** Brown university 1893-96; Library school 1896-date; assistant Brown university library Sep. 1895-June 1896.

205 **Haynes, Frances Eliza.** B. L. Mt Holyoke college 1895; Library school 1896-date.

206 **Hunt, Clara Whitehill.** Library school 1896-date; assistant Public library, Utica, N. Y. Aug. 1895, July-Aug. 1896.

207 **Imhoff, Ono Mary.** Woman's college of Baltimore 1896; Library school 1896-date; attended A. L. A. meeting 1895.

208 **Norton, Elisabeth.** B. A. University of Vermont 1896; Library school 1896-date.

209 **Officer, Helen Fuller.** B. L. University of Denver 1886; Library school 1896-date; attended A. L. A. meeting 1895.

210 **Reed, Mabel Florence.** B. L. Smith college 1896; Library school 1896-date.

211 **Rogers, Florence Sally.** B. S. Wellesley college 1894; Library school 1896-date.

212 **Sawyer, Laura Maria.** B. A. Acadia college, Wolfville, Nova Scotia 1896; Library school 1896-date.

213 **Sherrill, Cecelia Adelaide.** B. A. Smith college 1893; Amherst summer school of library economy Aug. 1893; Library school 1896-date; assistant Public library, Utica, N. Y. Dec. 1893-Oct. 1896.

214 **Skinner, Marie Aurelia.** B. A. Lake Forest (Ill.) university 1896; Library school 1896-date.

215 **Williams, Hugh.** B. A. Adelbert college 1896; Library school 1896-date; assistant Hatch library, Adelbert college July 1895-May 1896; assistant Public library, Cleveland, O. June-Aug. 1896; attended A. L. A. meeting 1896.

216 **Wilson, Ellen Summers.** Library school 1896-date.

27 **Wyer, James Ingersoll, jr.** University of Minnesota 1895-96; Library school 1896-date; assistant Public library, Minneapolis Jan-Sep. 1896; attended A. L. A. meeting 1896.

This register covers the first 10 years of the Library school, from its opening Jan. 5, 1887 through Dec. 31, 1896. A manuscript supplement brings the record to date, and the active cooperation of students is desired in order that future editions may be as complete as possible. Each student is asked to correct his record as it appears in the register and to fill out deficiencies if necessary, adding any offices he may have held in the national, state or local library associations. Dates should include month as well as year. A — between two dates means through or including the latter date; e. g. work done Jan.—June 1896 indicates work begun in Jan. and continued through the whole or part of June 1896.

Prompt notice of corrections and of change of position or termination of office should be sent to Florence Woodworth, Director's assistant, State Library, Albany, N. Y.

GEOGRAPHIC SUMMARY OF STUDENTS

January 1887

Positions filled; permanent and temporary		RESIDENCE OF STUDENTS BY								
		1887	1887-88		1888-89		1889-90		1890-91	
			Senior	Junior	Senior	Junior	Senior	Junior	Senior	Junior
	California	1	..	..	..	..	..	..	..	..
29	Connecticut.....	1	..	1	..	1	..	..	..	2
2	Delaware .....	..	..	..	..	..	..	..	..	..
10	Dist. of Columbia..	..	..	..	..	..	..	..	..	..
2	Georgia .....	..	..	..	..	..	..	..	..	..
51	Illinois.....	1	1	2	2	..	..	1	1	2
2	Indiana	1	1	1	1	..	..	..	..	1
5	Iowa .....	..	..	..	..	1	1	1	..	..
	Kansas.....	..	..	..	..	1	..	..	..	..
7	Maine.....	1	1	1	..	..	..	..	..	..
1	Maryland .....	..	..	..	..	..	..	..	..	1
60	Massachusetts.....	5	3	8	7	3	1	3	2	3
9	Michigan.....	..	..	..	..	..	3	1	..	..
1	Minnesota.....	..	..	..	..	..	..	..	..	..
6	Missouri.....	1	..	..	1	1	..	1	1	..
2	Montana .....	..	..	..	..	..	..	..	..	..
7	Nebraska.....	..	..	..	..	..	..	..	..	1
4	New Hampshire...	..	..	1	1	..	..	..	..	1
21	New Jersey.....	..	..	2	1	3	..	..	..	1
247	New York.....	7	3	3	3	10	2	5	2	5
4	Ohio.....	..	1	..	..	..	..	..	..	1
38	Pennsylvania .....	..	..	..	..	2	2	..	..	2
8	Rhode Island.....	..	..	1	1	1	..	..	..	..
4	Tennessee.....	..	..	..	..	..	..	..	..	..
	Utah .....	..	..	..	..	..	..	..	..	..
7	Vermont.....	..	..	..	..	..	..	..	..	..
2	Virginia .....	..	..	..	..	..	..	..	..	..
1	West Virginia.....	..	..	..	..	..	..	..	..	..
3	Wisconsin.....	1	1	1	1	..	..	..	..	..
1	Canada .....	..	..	..	..	..	..	..	..	..
1	England	1	..	..	..	..	..	..	..	..
	Germany.....	..	..	1	1	..	..	..	..	..
	Sweden.....	..	..	..	..	..	..	..	..	..
535		20	11	22	19	23	6	14	7	20

DENTS FOR THE FIRST 10 YEARS

-December 1896

FORE ENTERING THE SCHOOL														Total different students
1891-92		1892-93		1893-94		1894-95		1895-96		1896-97		Total juniors and seniors		
Senior	Junior	Senior	Junior	Senior	Junior	Senior	Junior	Senior	Junior	Senior	Junior			
..	..	..	..	..	..	..	..	..	..	..	..	1	1
I	..	..	I	..	..	..	..	..	3	3	I	14	10
..	
..	..	..	..	..	..	..	..	..	..	I	..	1	1
..	
I	4	..	3	I	..	..	..	..	..	..	I	20	14
..	I	..	..	..	..	..	..	..	..	..	..	6	4
I	..	..	..	..	..	..	..	I	..	..	..	5	3
..	..	..	..	..	I	..	..	..	..	..	..	2	2
I	I	..	I	..	..	..	..	..	I	I	..	8	6
..	..	..	..	..	..	I	..	..	..	..	..	2	2
2	2	2	I	I	5	I	6	I	3	4	3	66	42	
..	..	I	2	..	..	..	..	..	..	..	I	8	7
..	..	..	..	..	I	..	..	..	..	..	I	2	2
..	..	..	..	..	I	I	..	..	..	..	..	7	4
..	
I	I	I	I	..	..	I	..	..	..	..	I	7	4
..	I	..	..	..	..	..	..	..	..	..	..	4	3
I	..	..	I	..	..	..	I	..	..	..	..	10	7
4	9	5	6	2	5	8	7	3	12	6	5	112	70	
..	I	..	..	..	3	2	I	..	..	..	I	10	8
I	..	..	..	..	I	I	I	..	I	..	..	11	7
..	I	I	..	..	I	I	I	I	I	..	2	12	8
..	I	..	..	..	..	..	..	..	..	..	..	I	I
..	..	..	..	..	..	..	..	..	..	..	I	I	I
..	..	..	..	..	I	I	I	..	..	..	..	3	2
..	
..	
..	..	..	..	..	..	..	..	..	..	..	..	4	2
..	..	..	..	..	..	..	..	..	..	..	I	I	I
..	..	..	..	..	I	..	I	..	..	..	..	3	3
..	..	..	..	..	..	..	..	..	..	..	..	2	I
..	..	..	..	..	I	..	..	..	..	..	..	I	I
13	22	10	16	4	21	17	19	6	21	15	18	324	217	

Residence. Since its opening in 1887 the New York state library school has had 74 students from New York and has also drawn 137 from 29 other states and 6 from England, Germany and Sweden.

Positions. From January 1887 through December 1896 its students have filled 247 positions in New York and 278 in 24 other states, 10 in the District of Columbia and two in two foreign countries making a total of 537 positions.

Of the 217 matriculated students, 35 are not recorded as employed in library work since their connection with the school, omitting those belonging to the present junior and senior classes. Of these, 2 entered the school not intending to take library positions, 5 have married, 2 have died, 9 are engaged in other work, 12 withdrew on account of ill health or for family reasons. Thus only 5 of those who might be expected to be engaged in actual library work, or a little more than 2% of the whole number matriculated, are not on our record as having accepted positions.

Preliminary education. The following table is interesting as pointing to the better quality of library work which must inevitably follow the more thorough general education of library students:

	Size of class	No. holding college degree	No degrees but having one or more years in college	High-school graduates who did not take their advanced work in college
Class of 1888.....	22	6	3	13
Class of 1889.....	22	6	5	11
Class of 1890.....	23	6	4	13
Class of 1891.....	14	4	3	7
Class of 1892.....	19	6	2	11
Class of 1893.....	23	5	5	13
Class of 1894.....	15	7	2	6
Class of 1895.....	21	9	3	9
Class of 1896.....	19	5	7	7
Class of 1897.....	21	13	2	6
Class of 1898.....	18	11	5	2
Total	217	78	41	98

Credentials. Of the 217 students matriculated in the school since Jan. 5, 1887, 22 completed the course at Columbia university library, and are counted as graduates of the school though they do not hold the state diploma. 45 hold a diploma from the University of the State of New York. Of these 45, 14 have received the degree B. L. S. Besides these, 44 others hold the first year certificate.

Students completing course at Columbia university library

Baldwin, Elizabeth G.
 Clarke, Edith Emily
 Cole, George Watson
 Cutler, Louisa Salome
 Denio, Lillian
 Fernald, Harriet Converse
 Godfrey, Lydia Boker
 Hopson, Ema K.
 Jackson, Annie Brown
 Jones, Ada Alice
 Marsee, Isabel Rebecca

Medlicott, Mary
 Miller, Eulora
 Palmer, Henrietta Raymer
 Patten, Francis Chauncey
 Plummer, Mary Wright
 Prescott, Harriet Beardslee
 Seymour, May
 Underhill, Caroline Melvin
 Ward, Ama Howard
 Wire, George E.
 Woodworth, Florence

Students holding diplomas from University of the State of New York

Avery, Myrtila, B. L. S.
 Biscoe, Ellen Dodge
 Bowerman, George Franklin,
 B. L. S.
 Browne, Nina Eliza, B. L. S.
 Bullock, Edna Dean
 Bullock, Waller Irene
 Bunnell, Ada, B. L. S.
 Burdick, Esther Elizabeth
 Burns, William Savage, B. L. S.
 Cattell, Sarah Ware, with honor
 Champlin, George Greenman
 Christman, Jenny Lind, B. L. S.
 Church, Henrietta
 Davis, Mary Louise, with honor
 Denio, Herbert Williams
 Eastman, Rev. William Reed,
 B. L. S.
 Ellis, Mary
 Foote, Elisabeth Louisa, B. L. S.
 Forsyth, Walter Greenwood
 Harrison, Joseph LeRoy, B. L. S.
 Harvey, Elizabeth
 Hawes, Clara Sikes
 Hawley, Mary Elizabeth
 Jones, Mary Letitia, B. L. S.

Kroeger, Alice Bertha, with honor
 Leonard, Grace Fisher, with honor
 Macky, Bessie Rutherford, B. L. S.
 Middleton, Jennie Young
 Olcott, Frances Jenkins
 Plympton, Charles William, with
 honor
 Pond, Nancy May, B. L. S.
 Rathbone, Josephine Adams,
 B. L. S.
 Rice, Helen Ware
 Robbins, Mary Esther
 Sharp, Katharine Lucinda, B. L. S.
 Sheldon, Helen Griswold
 Silliman, Helen Cornwell
 Sperry, Helen, with honor
 Stanley, Harriet Howard, with
 honor
 Sutermeister, Louise Mathilde
 Sutliff, Mary Louisa
 Swayze, Mary Camilla
 Temple, Mabel
 Wheeler, Martha Thorne, with
 honor
 Wilson, Minnie Cornwell, with
 honor

Graduation bibliographies. The original bibliography which must be submitted as one of the conditions of graduation in the school is an important feature of senior year, and no part of the school work is done with greater thoroughness or enthusiasm. The students in choosing subjects and the faculty in approving them try to secure those which will be of practical value. Those not in print are lent in manuscript where specially needed; e. g. the bibliography on municipal government has been sent recently to Providence, Chicago, Leland Stanford university, New York, and Philadelphia, for the temporary use of persons wishing to consult it. The school is glad to receive suggestions from librarians, teachers, leaders of clubs, or specialists, as to subjects for which they wish bibliographies or reading lists.

BIBLIOGRAPHIES AND READING LISTS

- | | |
|------------|---|
| 012 | Phillips Brooks. G: W. C. Stockwell, '95 |
| 012 | Hawthorne. N. E. Browne, '89 |
| 012 | Ben Jonson. Mrs Mary (Wellman) Loomis, '90 |
| 012 | Charles Kingsley. E. E. Burdick, '90 |
| 012 | John Lothrop Motley. M. E. Robbins, '92 |
| 012 | Charles Sumner. H. W. Denio, '94 |
| 012 | Bayard Taylor. W: S. Burns, '91 |
| 012 | John Wesley. E. L. Foote, '92 |
| 012 | Poems on Lincoln, Grant, Sherman and Sheridan. M. L. Sutliff, '93 |
| 013 | Members of the A. L. A. H. C. Silliman, '95 |
| a 016.01 | Index to subject bibliographies in library bulletins. Alice Newman, '97 |
| 016.0285 | Lists of books for children. J. Y. Middleton, '91 |
| 016.2217 | Higher criticism of the Old testament. (Select) Rev. W: R. Eastman, '92 |
| 016.246 | Christian art. (Select) M. L. Davis, '92 |
| 016.27 | Church history. (Reading list) Elizabeth Harvey, '90 |
| b 016.28 | Religious denominations of the U. S. (Select) G: F. Bowerman, '95 |
| 016.339 | Tramps and vagrants. L. D. Waterman, '97 |
| 016.352073 | Municipal government in the U. S. M. L. Jones, '92 ; J. A. Rathbone, '93 ; E. D. Biscoe, '96 |
| c 016.36 | Practical philanthropy through scientific study; outlines and references for a two years' course. I. E. Lord, '97 |
| 016.361 | New philanthropy. (Reading list) H. G. Sheldon, '93 |

a To be printed in New York state library. *Bulletin; bibliography*

b N. Y. 1896. Cathedral library association. 75c.

c To be printed in *American journal of sociology*, Jan. 1898. Separate reprint 50c.

- 016.376 Education of women. M. E. Hawley, '93
- 016.37813 Consolidated index to university extension periodicals.
Myrtilla Avery, '95
- 016.398 Fairy-tales for children. (Select) F. J. Olcott, '96
- 016.3982 English works on King Arthur and the round table. F. R.
Curtis, '96
- 016.508 Out-of-door books. (Select) H. H. Stanley, '95
- 016.7 Renaissance art. (Reading list) A. S. Ames and E. P.
Andrews, '97
- 016.7 Art of the 17th century. (Reading list) N. M. Pond, '96
- 016.7266 Some famous cathedrals. (Reading list) L. M. Suter-
meister, '90
- 016.75 Ten great paintings. (Reading list) Ada Bunnell, '91
- 016.792 Greek and Latin plays produced by schools, colleges and
universities in the U. S. G: G. Champlin, '95
- 016.796 Cycling. Louise Langworthy, '97
- 016.799 Angling, supplementing Westwood and Satchell's *Biblio-
theca piscatoria*. Henrietta Church, '93
- 016.811 Minor American poets, from 1860–date. (Select) B. S.
' Smith, '97
- 016.82 English literature of later 18th century. (Select) M. C.
Swayze, '89
- 016.823 Fiction for girls. (Select) A. B. Kroeger, '91
- 016.91 Graded list of history and travel prepared in the Lincoln
(Neb.) public library for the use of the Lincoln public
schools. E. D. Bullock, '94
- 016.914 Books to read before going to Europe. (Reading list)
S. W. Cattell, '90
- 016.9752 Maryland; colonial and revolutionary history. W. I.
Bullock, '92
- 016.916 English and American explorations in Africa since 1824.
(Reading list) H. W. Rice, '93
- 016.917 Travel in America. (Reading list) C: W. Plympton, '91
- 016.91747 Literature relating to the Hudson river. M. T. Wheeler, '91
- 016.9178 Travels west of the Mississippi prior to 1855; a partial
bibliography of printed personal narratives. K. L.
Sharp, '92

^a To be printed in New York state library. *Bulletin: bibliography*

^b Printed in *Book news*, July 1890, 8: 393-95

^c Printed in New York state library. *Bulletin: bibliography*, no. 3

- o16.92 Josephine and the women of her time. Mary Ellis, '92
- o16.92 200 books on biography for a popular library. (Select)
Mabel Temple, '90
- ^a o16.9406 History of the latter half of the 15th century. (Reading
list) Etheldred Abbot, '97
- ^b o16.9407 History of the 17th century. (Reading list) G. F.
Leonard, '95
- o16.94144 Edinburgh. (Reading list) W. G. Forsyth, '93
- ^a o16.9453 Venice. (Reading list) Helen Sperry, '94
- ^a o16.9492 The Netherlands. (Reading list) E. G. Thorne, '97
- ^a o16.952 Japan. (Reading list) H. K. Gay, '95
- ^c o16.974 Colonial New England. (Reading list) M. C. Willson, '95
- o20.5 Consolidated classified index to the *Library journal*, v. 1-12
B. R. Macky, '92; J. L. Christman, '93; C. S.
Hawes, '94; J. G. Cone, '95
- ^a 811.49 Cap and gown; some college verse. J. L. Harrison, '93

Graduation theses. The following is a complete list of theses presented :

- o16.8 The librarian and modern literature; with a suggested course
of reading in preparation for the Library school. I. E.
Lord, Alice Newman and L. D. Waterman, '97
- ^c o20 How to make the most of a small library. Lilian Denio, '88
- o20.6 State and local library associations. N. M. Pond, '96
- o21.1 How to make a public library useful. C. W. Plympton, '91
- o21.1 Local public libraries and their connection with university
extension. M. L. Davis, '92
- o21.1 Local public libraries and their relations to university exten-
sion. Rev. W. R. Eastman, '92
- o21.1 Local public libraries and their relations to university exten-
sion. Mary Ellis, '92.
- ^f o21.1 Local public libraries and their relation to university exten-
sion. K. L. Sharp, '92
- o21.1 The 'people's college'; local public libraries and their rela-
tions to university extension. E. L. Foote, '92
- ^e o21.2 The library as an educator. A. A. Jones, '88
- o21.3 The teacher's attitude towards the library and the joint task
of the library and school. E. D. Bullock, '94

^a To be printed in New York state library. *Bulletin: bibliography*

^b Printed in New York state library. *Bulletin: bibliography*, no. 4

^c Printed in New York state library. *Bulletin: bibliography*, no. 8
Bost. 1893. Knight, \$1.25

^e Printed in *Library notes*, March 1889, 3:46-74

^f Printed in New York state university. *Extension bulletin*, no. 4

^g Printed in *Library notes*, July 1892, 3:367-79

- 021.7 Library advertising. G: G. Champlin, '95
- 023 Variety of work vs specialization for assistants in large libraries.
Elizabeth Harvey, '90
- 023.4 Knowledge of languages necessary to a librarian. M. C.
Swayze, '89
- 023.4 The librarian's duty in the direction of self-culture. W. G.
Forsyth, '93
- 023.4 Manual of technical library terms, in various languages.
M. E. Hawley, '93
- 023.4 Qualifications essential to success in librarianship. G: W.
Cole, '88
- 023.5 Lay assistance in libraries. J. A. Rathbone, '93
- 024 Comparative library rules. W. I. Bullock, '96
- ^a 024.1 Age limit in public libraries. A. B. Kroeger, '91
- ^b 024.4 The librarian's relations to his readers. Eulora Miller, '88
- 024.5 Access to shelves. W: S. Burns, '91
- 024.5 How to keep the library quiet. F. J. Olcott, '96
- 025 How I would reorganize the X library. L. M. Sutermeister,
'90
- 025.1 Analysis of a library bulletin. F. R. Curtis, '96
- 025.1 Library statistics. Mabel Temple, '90
- 025.3 Advantages and disadvantages of the classed catalogue.
Louise Langworthy, '97
- 025.3 Card catalogues. H. C. Fernald, '88
- 025.3 Cost of card and printed catalogues. H. W. Denio, '94
- 025.3 Some famous catalogue rules. H. W. Rice, '93
- 025.4 Principles of classification. G. F. Leonard, '95
- 025.4 Value of a classified arrangement of books to trustees, libra-
rian and readers. J. L. Christman, '93
- 025.4 Which is more useful, the reference librarian or the catalogue?
H. C. Silliman, '95
- 025.5 Library bulletins. M. E. Robbins, '92
- 025.5 Reference work in popular libraries. Helen Sperry, '94
- 025.5 Two essays in librarianship: The reference librarian. The
selection of books. G: F. Bowerman, '95
- 025.6 Some charging systems. E. S. Loveland, '95
- 025.8 Shelf lists. N. E. Browne, '89
- ^c 026 Music and collections of art photographs in public libraries.
A. B. Jackson, '88

^a Printed in *Library notes*, July 1892, 3: 386-90

^b Printed in *Library notes*, July 1892, 3: 379-85

^c Printed in *Library notes*, March 1889, 3: 463-69

- 026.7 Collections of art books in the United States. Mrs Mary (Wellman) Loomis, '90
- 026.77 Photographs in libraries. H. G. Sheldon, '93
- 026.78 Music in libraries. B. S. Smith, '97
- 027 Library renaissance. M. W. Plummer, '88
- ^a 027.072 Public library movement in the United States. J. L. Harrison, '93
- 027.1 Private libraries. Henrietta Church, '93
- 027.4744 Discussion of some questions suggested by the public library of Southbridge, Mass. H. H. Stanley, '95
- 027.4744 Memorial Hall library. J. Y. Middleton, '91
- 027.4746 The Norfolk (Ct.) library. S. W. Cattell, '90
- 027.4747 The library of district no. 11. E. E. Burdick, '90
- 027.4747 New York public library; its past history and future development. H. K. Gay, '95
- 027.5 The state library in relation to its public. B. R. Macky, '92
- 027.6 Some types of special libraries. Ada Bunnell, '91
- 027.6 Traveling libraries. C. S. Hawes, '94
- 027.7 Some problems confronting a college librarian. M. L. Jones, '92
- ^b 027.8 The Sunday-school library. M. T. Wheeler, '91
- 028.4 Fiction in libraries, with suggestions for a black-list and stepping-stone list. E. P. Andrews, '97
- 028.5 Children's reading lists. M. L. Sutliff, '93
- 028.5 Children's reading rooms. M. C. Wilson, '95
- 028.5 Some American authors of juvenile literature. J. G. Cone, '95
- 028.9 Black-list and stepping-stone books. E. D. Biscoe, '96
- 028.9 Debatable land. A. S. Ames, '97
- 374 Study clubs. Myrtila Avery, '96
- 808 Some recent translations of literature, biography and travel. Etheldred Abbot, '97

^a Printed in *New England magazine*, Ag. 1894, 10: 700-22.

^b Printed in *Library notes*, July 1892, 3:391-401.

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University of the State of New York

NEW YORK STATE MUSEUM

FIFTIETH ANNUAL REPORT

OF THE

R E G E N T S

1 8 9 6

VOL. I

REPORT OF DIRECTOR, BOTANIST AND
ENTOMOLOGIST

TRANSMITTED TO THE LEGISLATURE FEBRUARY 5, 1897

ALBANY

UNIVERSITY OF THE STATE OF NEW YORK

1898

University of the State of New York

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STATE OF NEW YORK

No. 48

IN SENATE

FEBRUARY 5, 1897

FIFTIETH ANNUAL REPORT

OF THE

NEW YORK STATE MUSEUM

To the Legislature of the State of New York

I have the honor to submit herewith, pursuant to law, as the 50th annual report of the University on the New York State Museum, the reports of the director of the museum, of the geologist and paleontologist, of the botanist, and of the entomologist, with appendix.

ANSON JUDD UPSON

Chancellor

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VOL. 2

Report of state geologist and paleontologist.

NEW YORK STATE MUSEUM.

REPORT OF THE DIRECTOR, 1896.

REPORT OF THE DIRECTOR.

ALBANY, N. Y., Sept. 30, 1896.

To the Honorable the Regents of the University of the State of New York:

GENTLEMEN.—I submit herewith my report for the fiscal year just ended.

Owing to the reduced condition of the appropriation for the State Museum, the year has been to some extent one of disappointment, inasmuch as the work originally planned could not be carried out; but a marked improvement has been made in the condition of several of the collections, and with the promise of additional funds for our work, the outlook is more encouraging. The personal work of the Director during the first part of the year, was devoted to the completion of the Bulletin on the Mineral Resources of New York which was distributed last April, and which also appears as an appendix to the Forty-eighth Annual Report of the State Museum, now in press. The remainder of the winter months were occupied in supervising the work on the mineralogical and palaeontological collections and in gathering material for the publications in preparation. These are, a bulletin on "Road Materials in New York" and a guide to the geological collections of the Museum.

On account of the total lack of funds for obtaining new information, these publications have progressed but slowly, but they will be finished during the coming year.

During the past summer, the Director made an examination of the gypsum quarries near Mumford, New York, the sandstone quarries at Medina and the salt works at Syracuse; he also attended at Buffalo, the meetings of the National Education Association and the American Association for the Advancement of Science. At the request of the Chairman of the State Museum Committee, the preparation of a catalogue of geological museums in the United States and Canada has been undertaken, and the first draft is herewith communicated.

The Museum assistant, Mr. J. N. Nevius, has kept a diary of his detailed work, and from this record the greater part of the following report is prepared.

A large part of the time of the assistant curator during the past fiscal year has been occupied in giving to the collections a more scientific arrangement and a more attractive appearance.

The principal work has been the rearrangement of the palaeontological collection on the second floor; the collection of nuclei for a synoptical geological collection, and for a collection of birds' nests with eggs; the determination of specimens (chiefly mineralogical) brought to the Museum for identification; the distribution of loan collections of minerals to institutions under the University; and the installment of several important additions to the collections.

The work on the palaeontological collection of New York state occupied all of the winter months. The specimens had been mounted on wooden blocks covered with paper. This had become badly soiled and faded, as had also the labels, which could be read only with great difficulty. The collection had, besides, not kept pace with the progress of this science, in the last few years, so that much of the nomenclature was out of date.

A supply of terra cotta "ingrain" wall-paper was obtained and cut to fit the blocks. The specimens were then removed, a few at a time, and the blocks covered with the new paper; the labels were revised and rewritten, the old name appearing in parenthesis where possible. The authority chiefly used for this work was "North American Geology and Palaeontology," by S. A. Miller; referring doubtful cases to the "Palaeontology of New York."

Several unrecorded figured specimens were found. These were labeled with a green diamond-shaped lozenge, bearing numbers referring to volume, plate, and illustration where figured in the "Palaeontology of New York."

In returning the specimens to the cases, they were arranged in their natural classes; the lowest class in a geological horizon being placed first, and so upward to the highest form; the genera being arranged alphabetically.

The block bearing each specimen is numbered (under the label), and the same number occurs on both the old and new label. The old labels are stored in the order in which they were removed, and by this system of numbering, can be produced at a moment's notice.

During the year five field excursions were made by Mr. Nevius in the interests of citizens of the state.

Mr. W. A. Ray, of Rayville, Columbia county, had a deposit of impure bog-ore (limonite) on his farm, which he wished investigated, as a possible source of mineral paint. He also wanted some traces of limonite investigated. A trip to the locality revealed the fact that bog-ore was being formed from iron derived by alteration of pyrites in the decomposing Hudson River shale in the immediate vicinity. The deposit was neither sufficiently extensive, nor of good quality for use as a pigment.

The small deposits of limonite were in the Calciferous-Trenton limestone, and gave no evidence of extensive deposits near at hand. They were but small accumulations of limonite along joints and fractures, and were without doubt derived from alteration of pyrite (or possibly siderite) near by.

Other excursions were taken at the request of Dr. E. J. Fisk, of Troy—the object sought being an ore of manganese. At a quarry in the Hudson River shale opened for road-metal, about two and a half miles west of Watervliet, some fairly good specimens of psilomelane had been found. The ore occurs in small, irregular pockets, rarely affording more than a few pounds of ore to the cubic yard. But the shale being badly fractured, as is usual in this region, gave free access to percolating water, and this agent had left a thin, shiny black film of psilomelane on the rock surfaces along the interstices, wherever it could penetrate, so that to a hasty glance the whole rock-front appeared to be rich in manganese.

The other excursions were beyond the boundaries of the state, but further than the collection of specimens for the museum, nothing of importance was accomplished.

During the year five institutions under the State University have been supplied, under the proper authority, with the loan collections of minerals made up from the duplicates of the museum collection.

The institutions supplied are:

- 1 State normal college, Albany
- 2 Albany female academy
- 3 White Plains union school
- 4 Athens union school
- 5 Naples union school.

Four new collections of about one hundred specimens each were prepared, two of which are still on hand.

During the winter the storeroom in the basement of State Hall was ceded to the State Engineer and the southeast pavilion on the fifth floor of the Capitol was set apart as a storeroom for museum property. All the duplicate minerals and other property of the museum stored in the basement of the State Hall were removed to this pavilion.

The property of the state on the fifth floor of the Capitol, which was returned from the World's Columbian Exposition, has suffered much from exposure, and required much attention at different times when work on the Capitol necessitated shifting its position. To preserve it from frequent moving and from molestation, the Director applied to the Capitol Commissioners for an assignment of space for its preservation. It has, accordingly, been placed in the two curtain rooms on the east front and fenced in, and is now protected from violence.

The collections of quadrupeds and reptiles have been provided with new and corrected labels, and the specimens have been cleaned.

The unattractive arrangement of the quadrupeds and birds is necessitated by the crowded condition of the museum, as these specimens must now be placed where they will fit, instead of where the proper classification would place them. This gives them the appearance of being in storage, rather than on exhibition to instruct the public.

An opportunity being offered by Mr. Charles Miller, jr, of Grand Rapids, Mich., to exchange New York Unionidae for those of Wisconsin and Michigan, a list was prepared of the duplicates of these shells.

The garnets in the general mineral collection have been studied and the species of each specimen determined and noted on the label.

Mr. G. V. Bailey, formerly with Ward's Natural Science Establishment, and later with the Smithsonian Institution, was employed for about ten days in repairing the fossil vertebrates. He repaired some of the plaster casts which had been broken, and put the Ellenville mastodon tusk in good condition, fixing in place many loose fragments of the interior and of the enamel.

He removed and repaired the right tusk of the Cohoes mastodon and replaced it in its proper position; soaked the dry parts of the skeleton with a thin solution of glue, and coated them with paraffine to exclude the air. His work was highly satisfactory and of great benefit to the specimens.

The case of precious and semi-precious stones has been somewhat rearranged; the labels revised and rewritten.

The collection of shells from Mazatlan, Mexico, presented by P. P. Carpenter, has been cleaned and the broken specimens repaired.

In order to better illustrate the composition, gradation from acid to basic series, and other relations, of the Rosenbusch Collection of Massive Rocks, which is exhibited on the second floor for the use of students; a translation has been made of Rosenbusch's table of massive rocks, and is placed near the collection. This table shows at a glance the essential constituents of the rocks; their gradation into each other; the method of naming the sub-varieties; and the general relations of the rocks to each other.

The drawers in the cases on the second floor have been numbered consecutively, and a catalogue prepared showing briefly the contents of each.

The outer row of table-cases on the second floor contained a series of rocks illustrating the stratigraphic geology of the state, but as this feature is more fully shown in the wall-cases on that floor, it was deemed advisable to use the tables-cases for a new feature.

A scheme has been prepared for an "Introductory" or "Synoptical" geological collection, and the nucleus of the collection has been roughly arranged. This collection purposes to illustrate, as far as possible with the limited space and means at hand, geological

terms and definitions; varieties of rocks; conditions of rock formation; appearance due to formation; and the formation of topography.

Specimens, photographs, models, and cross-references to other collections, will be used in illustration. As such an exhibition is a rarity in American museums, and as it would be of great value to teachers having students beginning the study of geology, as well as to intelligent visitors who desire a little insight into this subject, this collection should receive much more time and attention than can be given to it under present conditions. As far as carried out the collection has been arranged according to the following preliminary scheme:

I Rock-forming Minerals

A Primary minerals which mingle with others to form rock masses

B Minerals which form entire rock masses

C Common, but accessory minerals

D Minerals derived from others by alteration

1 Remaining in situ

2 Transported to a distance

E Vein-forming minerals

II Rocks

A Classification of rocks

1 Sedimentary rocks

i a Fragmental rocks

i Formed by weathering and erosion. In parallel series are shown the unconsolidated and the consolidated, as gravel, conglomerate; sand, sandstone; clay, shale, etc.

ii Volcanic, fragmental

iii Organic fragmental

calcareous

siliceous

carbonaceous

ferruginous

phosphatic

1 b Crystalline rocks

i Altered sediments

ii Chemical precipitates

2 Massive Rocks

2 a' Acid series

(quartz and orthoclase prominent)

2 b Intermediate series

2 c Basic series :

(quartz and orthoclase usually absent. Magnesian-iron silicates and basic feldspars predominant)

3 Schistose rocks

(metamorphic rocks)

B Rock characteristics

1 Characteristics of stratified rocks

1 a Lamination

1 b Jointing

1 c Preservation of foot-prints, mud cracks, etc., in strata

1 d Fossils

i Animal life

formation)

) of fossils

preservation)

ii Vegetable life

formation)

) of fossils

preservation)

2 e Coloring

2 Characteristics of crystalline rocks

2 a Micro-crystalline structure

2 b Macro-crystalline structure

2 c Banded structure

2 d Amygdaloidal structure

2 e Porphyritic structure

2 f Basaltic columns

2 g Concentric structure

III Decomposition of rocks soil formation

When this collection has progressed somewhat further than at present it is proposed to publish a handbook devoted to the subject, to aid the specimens in expressing the illustrations. A synopsis of such a handbook is being carried forward with the additions to the collection.

Another collection, new to the museum, that was started during the past year, is that of birds' nests and eggs. The majority of these were collected by the assistant curator in the vicinity of Albany—the remainder were presented to the museum by Mr. Robert Warwick, of Fleming, N. Y. The nests are mounted on walnut blocks with the natural limb, or tuft of grass, in which the nest rested, placed in its natural position; thus showing the various methods used by the birds in attaching the nests, or in screening them from enemies.

The eggs are placed in the nests in the exact position in which they were discovered—though the natural arrangement of the eggs in the nest appears to follow no law. Specimens of the male and female birds are placed by the nest of their own species.

All the space that can be allotted to this exhibition is already filled. This is to be regretted, as such an exhibition is far more interesting and instructive than isolated collections of the birds, eggs, and nests, and the lack of space to expand this collection is but another illustration of the great difficulties to contend with in giving the museum an attractive appearance, and a higher educational value.

In the appendix to this report will be found a list of this collection, also lists of additions to ornithological and oological collections.

One of the smaller oak cases used at the Columbian exhibition was brought from its storage place in the Capitol, put in repair, and used to exhibit the large specimens of green fluorite, from McComb, St. Lawrence county. This specimen was unfortunately broken in transit from Chicago.

In June, Mr. Eaton, of Canandaigua, was given permission to take measurements and make models of parts of the Cohoes mastodon skeleton. He desired the information in his work of restoring some bones of a mastodon belonging to Vassar college.

To fill a few of the gaps in the general mineralogical collection, a number of specimens were purchased of George L. English, of New York. A list of this purchase appears in the appendix to this report.

A valuable addition to the ornithological collection was the purchase through Ward's Natural Science Establishment of a part of the Austin F. Park collection of birds. Most of those purchased are young birds—which are almost unrepresented in the museum. They were mounted by Ward in the form adopted by the museum, and have been installed in the cases with the old birds of the same species. A list of this purchase appears in the appendix to this report.

A few more specimens of New York state petroleum from the Columbian exhibition were found in the Capitol, and installed with the other specimens on the third floor. A list of the petroleum collection appears in the appendix to this report.

The wall-cases on the second floor containing the stratigraphic geological collection have been cleaned and the specimens put in somewhat more attractive form. This collection needs further attention, to fill gaps and replace inferior specimens.

Many specimens, chiefly geological or mineralogical, have been identified for visitors—and questions concerning them answered.

The need of a proper handbook of the museum, to explain the collections and give a brief sketch of each of the sciences represented, is keenly felt, and will soon be met. Such a pamphlet will add immeasurably to the educational value of the museum, and, being carried home by visitors, will keep up their interest in science and tend to educate their powers of observation.

For the ensuing year the following improvements suggest themselves as being worthy of early attention:

- 1 The completion of the synoptical geological collection.
- 2 The advancement of the economic geological collection of the state. (This invaluable addition was started long ago and work suspended on account of lack of funds to gather material.)

3 New cases and an entire rearrangement in the mineralogical department; in order to gain the necessary room to exhibit the excellent collection belonging to the museum—and to make room for future growth.

4 New labels for the minerals. A label with no printing except species and variety name, having blank lines for addition of locality, etc., is contemplated.

5 A rearrangement of the New York state stratigraphic geological collections, and a new set of labels for them.

6 The rearrangement of the collection of ophidia now in the museum.

In addition to this administrative report, the Director communicates herewith two scientific papers, which form an appendix to it. These articles are respectively, *The Geology of the Crystalline Rocks of Southeastern New York*, and *The Origin of the Serpentine in the Vicinity of New York City*, by F. J. H. Merrill. A preliminary list of geological museums in the United States and Canada is also printed.

RECORD OF ATTENDANCE AT THE MUSEUM.

From October 1, 1895, to September 30, 1896, total attendance.....	52,003
Greatest monthly maximum, August.....	6,268
Greatest daily maximum, September 9.....	683

Additions to the Museum Collections

Ornithology

A COLLECTION OF BIRDS' NESTS AND EGGS DONATED BY ROBERT WARWICK

COMMON NAME	Scientific name	No. of eggs	Locality
Hermit thrush.....	<i>Turdus aonalaschkae pallasii</i> , Cab	3	Fleming, Cayuga county
Red-winged blackbird..	<i>Agelaius phoeniceus</i> , L.....	4	Fleming, Cayuga county
Long-billed marsh wren.	<i>Cistothorus palustris</i> , Wils	6	Fleming, Cayuga county
Rose-breasted grosbeak.	<i>Habia ludoviciana</i> , L.....	4	Fleming, Cayuga county
Yellow warbler.....	<i>Dendroica aestiva</i> , Gmel.....	5	Fleming, Cayuga county

EGGS

DONATED BY ROBERT WARWICK (*continued*)

COMMON NAME	Scientific name	No of eggs	Locality
Vesper sparrow	<i>Pooecetes gramineus</i> , Gmel....	4	Fleming, Cayuga co.
Field "	<i>Spizella pusilla</i> , Wils.....	4	Fleming, Cayuga co.
Song "	<i>Melospiza fasciata</i> , Gmel.....	4	Fleming, Cayuga co.

COLLECTED BY J. N. NEVIUS

Chipping "	<i>Spizella socialis</i> , Wils.....	3	Glenmont, Alb. co.
Catbird	<i>Galeoscoptes carolinensis</i> , L....	5	Kenwood, Alb. co.
Long-billed marsh wren. ^{all 4}	<i>Cistothorus palustris</i> , Wils....	6	Newark Meadows, N. J.
Rose-breasted grosbeak.	<i>Habia ludoviciana</i> , L.....	1	South Orange, N. J.
Swamp-sparrow	<i>Melospiza georgiana</i> , Lath....	4	Bethlehem, Alb. co.
Indigo bunting.....	<i>Passerina cyanea</i> , L.....	4	Kenwood, Alb. co.
Chipping sparrow.....	<i>Spizella socialis</i> , Wils.	3	Glenmont, Albany county
Song sparrow	<i>Melospiza fasciata</i> , Gmel.....	3	Kenwood, Albany county
Baltimore oriole.....	<i>Icterus galbula</i> , L.....	...	Kenwood, Albany county
Black-billed cuckoo....	<i>Coccyzus erythrophthalmus</i> , Wils.....	2	Kenwood, Albany county
Swamp sparrow.....	<i>Melospiza georgiana</i> , Lath....	5	Albany
Wood thrush.....	<i>Turdus mustelinus</i> , Gmel	3	Normansville, Al- bany county
Wood thrush.....	<i>Turdus mustelinus</i> , Gmel.....	4	Normansville, Al- bany county
Bobolink	<i>Dolichonyx oryzivorus</i> , L.....	4	Albany
Catbird	<i>Galeoscoptes carolinensis</i> , L...	4	Kenwood, Albany county
Red-eyed vireo.....	<i>Vireo olivaceus</i> , L.....	4	Kenwood, Albany county
Red-eyed vireo.....	<i>vireo olivaceus</i> , L.....	3	Kenwood, Albany county
Cowbird.	<i>Molothrus ater</i> , Bodd. (In nest of Red-eyed vireo.)	2	Kenwood, Albany county
Phoebe.....	<i>Sayornis phoebe</i> , Lath.....	*5	Castleton, Rens- selaer county
Phoebe.....	<i>Sayornis phoebe</i> , Lath.....	5	Ithaca, (1894)
Acadian flycatcher	<i>Empidonax acadicus</i> , Gmel....	5	Bethlehem, Al- bany county
Scarlet tanager.....	<i>Piranga erythromelas</i> , Veil....	2	Orange, N. J.
Indigo bunting.....	<i>Passerina cyanea</i> , L.....	3	Kenwood, Albany county
† Indigo bunting.....	<i>Passerina cyanea</i> , L.....	3	Kenwood, Albany county
Oven-bird	<i>Seiurus aurocapillus</i> , L.....	4	Bethlehem, Al- bany county
† Yellow-throated vireo.	<i>Vireo flavifrons</i> , Vieill.....	1	Kenwood, Albany county

* Eggs broken. † Contained cowbird's eggs.

BIRDS

DONATED BY A. J. McHARG

COMMON NAME	Scientific name	No. of specimens	Sex	Locality
Barred owl.....	<i>Syrnium nebulosum</i> , Pors.	1	♀	N. Scotland
BY PURCHASE				
Red-tailed hawk.	<i>Buteo borealis</i> , Gmel.....	1 young	♀	Greenbush
Short-eared owl.	<i>Asio accipitrinus</i> , Pall.....	1	♂	N. Albany
Saw-whet owl...	<i>Nyctala acadica</i> , Gmel.....	1	♀	E. Albany
Hermit thrush...	<i>Turdus aonalaschkae pal-</i> <i>lasii</i> , Cab	2	♂ & ♀	Green Island

BY PURCHASE FROM THE AUSTIN F. PARK COLLECTION

Kumlien's gull ..	<i>Larus kumlieni</i> , Brews.....	1	♀	Green Island
Leach's petrel...	<i>Oceanodroma leucorhoa</i> , Vie	1	♀	Lansingb'g
Ruddy duck.....	<i>Erismatura rubida</i> , Wils...	1	♂	Rens. co.
Corn crane.....	<i>Crax crex</i> , L.....	1	♀	Cohoes
Swallow-tailed kite	<i>Elanoides forficatus</i> , L.....	1	♂	Pittston, Rens. co.
Iceland gull	<i>Larus leucopterus</i> , Faber ..	1 young	♀	Lansingb'g
Double-crested cormorant	<i>Phalacrocorax dilophus</i> , Sw. & Rich	1	♂	Troy
Barrow's golden eye	<i>Glaucionetta islandica</i> , Gm.	1	♂	Green Island
American Spar- row-hawk	<i>Falco sparverius</i> , L.....	2 young	♂	"
Red-shouldered hawk	<i>Buteo lineatus</i> , Gmel	{ 5 young 2 "	♂ } ♂ }	Rens. co.
Marsh hawk	<i>Circus hudsonius</i> , L.....	1 young	♂	"
Sharp-shinned hawk	<i>Accipiter velox</i> , Wils	2 "	♂	"
Cooper's hawk..	" <i>cooperi</i> , Bonap...	{ 1 " 1 "	♂ } ♂ }	"
Green Heron....	<i>Ardea virescens</i> , L.....	{ 2 " 1 "	♂ } ♂ }	Green Island
Least Bittern ...	<i>Botaurus exilis</i> , Gmel.....	1 young	♂	"

COLLECTED BY J. N. NEVIUS

Ruby-throated humming bird.	<i>Trochilus colubris</i> , L.....	1	♂	Kenwood.
Indigo bunting..	<i>Passerina cyanea</i> , L.....	1	♂	"
Yellow-bellied flycatcher....	<i>Empidonax flaviventris</i> , Baird	1	♂	"
White-breasted nuthatch	<i>Sitta carolinensis</i> , Lath....	1	♂	"
Maryland yellow throat	<i>Geothlypis trichas</i> L.....	1	♂	"
Canadian warbler	<i>Sylvania canadensis</i> L.....	1	♀	"
Bay-breasted warbler	<i>Dendroica castanea</i> , Wils..	1	♂	"

Mineralogy

BY DONATION.

Quartz Crystal (1) from Theresa, Jef. co., N. Y., presented by J. L. Davison, 55 Waterman st., Lockport.

Bindheimite & Limonite (1) from Arabia Mine, Lovelock, Humbolt co., Nevada, presented by John Bridgford, of Albany.

Magnetite, from Hawley, Franklin co., Mass., presented by W. S. Snyder, of Green Island. In sharply defined, perfect crystals 1-12 inch. Occur disseminated through a disintegrating rock and were collected by "panning."

Magnetite (2) from Shaftsbury, Bennington co., Vt., presented by W. S. Snyder. Has a strongly marked schistose structure and flattened grains. Associated with quartz and epidote.

Carborundum (artificial). Several specimens donated on request by the Carborundum Company, of Niagara Falls.

Graphite (3) from Oneida county, N. Y., presented by W. S. Wright, of Syracuse. Occurring in slightly altered Hudson River shale.

Hornstone (2) from Amsterdam, N. Y., presented by John Hegeman, of Amsterdam.

Psilomelane (var. harzmanganite, Brush) (1) from Mass., presented by W. S. Snyder, of Green Island.

Psilomelane (1) from Shaftsbury, Bennington co., Vt., presented by W. S. Snyder, of Green Island.

Psilomelane (5) } from South Wallingford, Rutland co., Vt., pre-
Kaolin (3) } sented by G. W. Bradley, Manchester Depot, Vt.

Psilomelane (1) from Cleveland, Oswego co., N. Y., presented by C. S. Laraway, of Cleveland, for determination.

Garnet (var. almandite) (2) from N. Carolina, presented by W. W. Jeffries, of Philadelphia.

BY EXCHANGE.

Opalized Wood (2), Grass Valley, Nevada co., Cal., and
Rubellite in Lepidolite (2), San Diego co., Cal. Received from
Field Columbian Museum in exchange for Triplite from
Stoneham, Maine.

BY PURCHASE FROM GEORGE L. ENGLISH.

Manganite (1), Negaunee, Mich.
Gothite (1), Negaunee, Mich.
Turgite (1), Salisbury, Conn.
Olivine (2), near Webster, N. C.
Insect in Amber (2), Baltic Sea
Amber (1), Baltic Sea
Thaumasite (1), Burger's Quarry, West Paterson, N. J.
Diabantite (1), Burger's Quarry, West Paterson, N. J.
Sal-ammoniac (1), Vesuvius, Italy
Copalite (1), East Indies
Muscovite (1), near Henry, Lincoln co., N. C.
Clinochlore (1), Tilly Foster Mine, near Brewster, N. Y.
Orpiment (1), Mecur Mine, Mecur, Utah
Cuprite, var. Chalcotrichite (1), Morenci, Ariz.
Cyanite, var. Rhaetizite (1), Pfitch, Tyrol
Lorandite & Realgar (1), Allchar, Macedonia
Cronstedtite (1), Cornwall, England
Epsomite (1), Villa Rubia, Spain
Crocidolite (loose fibres) (1), Cochabamba, Bolivia
Crocidolite (1), Griqua Land, South Africa
Pyrite (altered) (1), Pelican Point, Utah Lake, Utah
Leucite (1), Monte Somma, Vesuvius, Italy
Leucite (1), Albana, near Rome, Italy
Leucite in lava (1), Albana, near Rome, Italy
Chalk (1), Dover Cliffs, England
Polybasite (4), Two Sisters' Mine, near Lawson, Colo.
Blue Spinel (2), Island of Ceylon
Natron (1), Lake Texcoco, Mexico
Rhodocrocite (1), John Reed Mine, Alicante, Lake Co., Colo.

BY COLLECTION.

Pyrolusite, psilomelane, magnetite: Several specimens of these minerals with associated rocks were collected in three trips, on request of Dr. E. J. Fisk, of Troy, who was investigating some manganese deposits in this region.

First excursion, three miles west of Watervliet,
Albany co., N.Y.

Second; two miles south of North Bennington, Vt.

Third; Charlemont, Franklin co., Mass.

Psilomelane, pyrolusite & limonite: A series of these minerals containing varying percentages of each were collected by J. N. Nevius at the South Wallingford, Vt., Manganese mines, on the request of Dr. E. J. Fisk, of Troy.

Quartz, agate & calcite, amygdaloid, in Triassic diabase. Collected by J. N. Nevius, at Upper Montclair, N. J.

Geology

COLLECTED BY HEINRICH RIES.

Sand from cut south of Spring Hill Grove, S. I.

Cross bedded sand, north of Hastings, S. I.

Hudson River sandstone, from drift on west shore of Great Neck,
L. I.

Fossils in concretion, west shore of Great Neck, L. I.

Yonkers Gneiss (2), Westchester county

Sand from cut on Elm Point, Great Neck, L. I., showing faulting
and crumpling.

Impure Siderite, (Cretaceous) Elm Point, Great Neck, L. I.

COLLECTED BY J. N. NEVIUS.

River sand, from Hudson River, Albany

River silt, from Hudson River, Albany

Anthracitic slate, Rayville, Columbia co., N. Y.

Siliceous limestone, South Wallingford, Vt.

Newark sandstone, Upper Montclair, N. J.

Hudson River shale, Normansville, Albany co., N. Y.

Shells in mud, Hudson River, Albany

Leaves in mud, Hudson River, Albany

Diabase concretion, Upper Montclair, N. J.

Hudson River shale (decomposing), and soil formed from its disintegration, Watervliet, N. Y.

Alluvium, Hudson River, Castleton, N. Y.

Residual soil formed by disintegration of a quartz magnetite rock, Charlemont, Mass.

Marble, South Wallingford, Vt. (A fresh specimen, one undergoing disintegration, and one of the soil resulting from its decomposition.)

DONATED BY F. W. WESTERMAN.

Clay (4), from Elm Point, Great Neck, L. I.

Lignite & Pyrite, from Far Rockaway, L. I., 409 feet below the surface.

BY PURCHASE FROM J. A. SINGLEY.

The following set of duplicates of a collection of Upper Miocene fossils from the Galveston Deep Well, Galveston, Texas. *These are unique as being the only marine Miocene fossils known from the Gulf slope west of Mississippi.

* See Am. Jour. Sci III Vol 46 pp 39-42. 4th Ann. Rept. Geol Survey of Texas pp 87-95.

No.	No. Specs.	NAME	Authority
112	4 valves..	Eriphyla galvestonensis.....	Harris
10	6 valves..	Cardium galvestonense.....	Harris
103	3 valves..	Strigilla galvestonensis.....	Harris
104	3 valves..	Rangia quadricentennialis.....	Harris
107	5 valves..	Rangia cuneata, var. galvestonensis.....	Harris
108	10 valves..	Macra quadricentennialis.....	Harris
109	14 valves..	Arca transversa, var. busana.....	Harris
110	1 spec....	Cylichnella bidentata, var. galvestonensis.....	Harris
114	1 spec....	Scala galvestonensis.....	Harris
115	10 specs....	Pyramidella galvestonensis.....	Harris
127	4 spec....	Phos galvestonensis.....	Harris
128	8 spec....	Nassa trivigalvesta.....	Harris
129	9 spec....	Nassa galvestonensis.....	Harris
130	8 spec....	Terebra galvestonensis.....	Harris
132	5 spec....	Strombina gibberula, var. galvestonensis.....	Harris
133	1 spec....	Drillia quadricentennialis.....	Harris
116	1 spec....	Olivella subtexana.....	Harris
124	10 spec....	Olivella galvestonensis.....	Harris
134	2 spec....	Cithara galvestonensis.....	Harris
135	6 spec....	Bittium galvestonense.....	Harris
139	3 spec....	Cerithium galvestonense.....	Harris
143	4 spec....	Cerithium galvestonense, sp. "A".....	Harris
145	3 spec....	Cerithium galvestonense, sp. "B".....	Harris
146	4 spec....	Cerithium galvestonense, sp. "Y".....	Harris
147	2 spec....	Terebra langdoni.....	Dall.
154	3 spec....	Pleurotoma albida.....	Perry
155	8 spec....	Natica canrena.....	Lam.
156	3 spec....	Natica eminuloides.....	Gabb.
157	9 spec....	Natica duplicata.....	Say
158	1 spec....	Cancellaria reticulata.....	Linn.
160	14 spec....	Dentalium quadrangulare.....	Sby.
161	15 spec....	Dentalium tetragonum.....	Sby.
162	9 spec....	Crucibulum auriculum (?).....	Gmel.
163	3 valves..	Gemma purpurea.....	Lea
164	4 valves..	Leda concentrica, var. (?).....	Say
166	3 valves..	Dreissensia sp. (?).....	
167	20 valves..	Lucina crenulata.....	Con.
168	4 valves..	Lucina dentata.....	Wood
169	5 valves..	Corbula swiftiana (?).....	Sby.
170	12 valves..	Corbula sp. (?).....	
171	4 valves..	Arca incongrua.....	Say
174	14 valves..	Macra lateralis.....	Say
175	6 specs....	Conus punctulatus, var. (?).....	Hwass
181	10 specs....	Terebra dislocata.....	Say
183	15 specs....	Oliva reticularis.....	Lam.
195	12 specs....	Coenangia bella.....	Con.
196	20 valves..	Balanus sp (?).....	

Number of species 47. Species new to science 25. Identified by Gilbert D. Harris.

Exhibit of New York State Petroleum

Part of the State Mineral Exhibit at the World's Fair

LOCALITY OF WELL	Owner	Lot
Alma, Allegany county	McDonald	28
" " "	Davis & Torrey	55
" " "	R. Allen	123
" " "	"	123
Bolivar, " "	"	13
" " "	"	13
" " "	"	14
" " "	Allen & Sternberg	15
" " "	"	16
" " "	"	23
" " "	"	64
Church Farm, Allegany county	"	25
Clarksville, " "	"	20
" " "	"	18
Genesee, " "	"	29
" " "	"	5
Seio, " "	J. Mills	8
" " "	" "	8
" " "	Norton	52
" " "	"	52
State Line, Cattaraugus county	"	3
Four Mile, " "	Sims	3
Allegany, " "	Union Oil Co	3
" " "	"	3
" " "	Laubenthal	10
Carrollton Town, Cattaraugus county	"	6
Greenwood, Steuben county	W. J. Penny	30
" " "	" "	30

Very respectfully submitted,

F. J. H. MERRILL,

Director.

APPENDIX A

THE GEOLOGY OF THE CRYSTALLINE ROCKS OF SOUTHEASTERN NEW YORK.

This paper contains a synopsis of the results of an investigation begun in 1883 and carried on at personal expense till 1890, from which time till 1893, small sums were afforded from the funds of the New York State Museum for continuing the field work. In 1895, there being no museum funds available for this purpose, the Director of the United States Geological Survey contributed \$200 for completing the Precambrian and Palaeozoic geology of the Harlem sheet of the United States topographic atlas, embracing the region about New York city. A copy of this Geologic map and of the descriptive text were furnished to Director Walcott and will be incorporated in the New York Folio which is soon to be published.

The preliminary results of the general investigation were published in the American Journal of Science, series 3, vol. XXXIX, p. 389. The geologic mapping of the whole area east of the Hudson in New York was published in the Economic and Geologic map of New York, by F. J. H. Merrill, and in the Preliminary Geological Map of New York*, compiled and published by W. J. McGee, under the direction of James Hall, State Geologist.

The geology of Westchester county is also shown on a scale of four miles to the inch, in the Geologic Map of a Part of Southeastern New York, by F. J. H. Merrill, published in Bulletin No. 15, of the New York State Museum, which also forms part of the 48th annual report of the New York State Museum. This bulletin also contains the Economic and Geologic Map.

In completing the work for the Harlem sheet of the New York folio the writer had an opportunity to review the ground in com-

* The draft for this publication was prepared at the request of Prof. Hall in 1893 and was not revised before engraving, so that it differs slightly from the map of Southeastern New York which contains the results of additional field work.

pany with Prof. C. R. Van Hise and secure his criticism and approval of the principal points discussed.

With the permission of the Director of the United States Geological Survey, the data obtained under his auspices in the field work of completing the Harlem sheet are herewith incorporated.

THE CRYSTALLINE ROCKS OF SOUTHEASTERN NEW YORK.

The crystalline rocks of southeastern New York lie on the east of the Hudson River, in New York, Westchester, Putnam and Dutchess counties, from whence they extend into Connecticut; and on the west of the river, in Orange and Rockland counties, whence they extend southwesterly into New Jersey. The lowest member is a coarse hornblende granite which forms the central mass of the range of mountains known as the Highlands of the Hudson, and, in their highest peak, Breakneck Mountain, is exposed through a vertical height of nearly 1,200 feet. (Pl. I.) With these greater masses of hornblende granite, are associated other local masses of granite comparatively free from hornblende, which are extensively used for building stone. (Pl. II.) These granites are probably igneous and of great age, and on their flanks are branded gneisses consisting chiefly of quartz and orthoclase with biotite and hornblende, containing numerous beds of magnetic iron-ore. The gneisses on the south side of the Highlands (Pl. III) extend through Westchester county in a series of folds with southwesterly trend, and on the northern slope of the Highlands at several places in Dutchess county, are overlain unconformably by Palaeozoic basal quartzites, which are believed to be of Cambrian age and are bordered by Ordovician limestone and slate or schist. Some of the principal valleys of Putnam county contain belts of limestone associated with quartzite and mica schist, which are probably to be correlated with similar rocks hereafter described as altered palaeozoic strata.

From the relation of the quartzite, limestone and schist of Westchester county to the underlying gneiss, which is precisely similar to that of the Palaeozoic strata in southern Dutchess county and

Putnam county to the subjacent gneiss, and from the nearly complete stratigraphic continuity, it is inferred that the crystalline limestone of Westchester county is equivalent to that of southeastern Dutchess county, the age of which has been satisfactorily established by the work of Dwight, Dana, and others to be Calciferous-Trenton, and the schist and micaceous gneiss overlying the limestone by like analogy is considered to be of Hudson river age.

Besides the older granites just mentioned, there are in Westchester and New York counties many later eruptive rocks of considerable areal importance.

Prominent among them is a red granite consisting chiefly of quartz, orthoclase and biotite which is injected into and through the gneiss at many points, and at Sing Sing, through the overlying limestone. In Yonkers township is a large area of reddish granite quite gneissoid in texture, which is intrusive in the Fordham gneiss.

The mica schist has been specially subject to igneous intrusions. Within its areas occur the Cortland series of diorites and norites described by J. D. Dana* and Geo. H. Williams,† the Harrison diorite described in detail by H. Ries,‡ the serpentines which are altered eruptives and certain gray granites which occur in domes, bosses and lenses in the southernmost part of Westchester county. Near the shores of Long Island Sound the Manhattan schist is everywhere injected with bands, lenses and dykes of pegmatite, granite, amphibolite and pyroxenite.

All the stratified crystalline rocks above described, with the possible exception of the Fordham gneiss, were originally sediments laid down in horizontal strata, the quartzite representing a beach deposit, the limestone, a deposit in water unaffected by wash from the land and probably of warmer temperature, and the schist a deposit of sandy mud in shoaler water. These three rocks form a reliable record of a period of subsidence of the land and transgression of the sea with subsequent recession and emergence.

*Am. Jour. Sci. III, Vol. xxii 1881 pp. 103-119.

† " " " xxxi 1886 pp. 26-41.
xxxiii 1887 pp. 135-144; 191-199.

‡ Trans. N. Y. Acad. Sci., Vol. xiv., 1895 pp. 80-86.

At a time or at times not accurately determined, but which probably began not later than the Upper Silurian, and may have continued at intervals to the end of the Palaeozoic, these horizontal strata by lateral pressure were thrown into parallel folds throughout a broad belt of country having a general northeasterly trend and with the Palaeozoic beds, the underlying rocks of greater age were also folded. As the cross sections show, the folds are closely compressed and in many cases are overthrown to the eastward and westward, so that frequently the rocks on both sides of the fold dip in the same direction. Associated with the longitudinal folding of these rocks was a transverse folding, the general result of which was elevation at the northward, so that the parallel ridges with their intervening valleys as a rule, pitch or slope very gently to the southwest. There are local variations from this general condition and some of the folds have locally a northward pitch, but the general condition may be noticed in the western ridges of Fordham gneiss which in the town of Yonkers attain a height of 300 feet, and on Manhattan Island pass below the sea level and do not reappear.

As already stated these rocks may be classified in the following manner:

CRYSTALLINE ROCKS.

Ordovician:

- 1 Manhattan schist, containing garnet fibrolite, kyanite and staurolite.
- 2 Inwood limestone, crystalline dolomite, containing diopside and tremolite.

Cambrian:

Lowerre quartzite

Precambrian.	{	Algonkian?	Fordham gneiss
		Archaean	{ Gneisses Granites

For detailed examination of these formations, it has been necessary to depend largely on the exposures along the east shore of the Hudson river and those in southern Westchester county and on New York Island. In central, eastern and northern Westchester county, the quaternary deposits of stratified and unstratified drift

are so thick and extensive that the outcrops are few. The localities discussed are therefore chiefly confined to the vicinity of New York city.

The stratified crystalline rocks within the area under consideration which is south of the 41° parallel belong to two principal divisions, the Precambrian and the Paleozoic. Of the Precambrian only one member can be recognized, which has been called the *Fordham gneiss*. Of the Palaeozoic there are two persistent members, the *Inwood limestone* and *Manhattan schist*, and a third of local and slight development, the *Lowerre quartzite*, which underlies the limestone.

PRECAMBRIAN.

FORDHAM GNEISS.

The Fordham gneiss, named from the former town of that name, within which it is well exposed, is a gray banded gneiss varying much in the composition of its bands or layers, which, as a rule, are quite thin, rarely exceeding two inches in thickness. Some of these are highly quartzose (Pl. IV.), some are largely composed of biotite and some consist of pegmatite or granite which has been injected parallel to the regular banding of the gneiss. Hornblende is an occasional constituent of this rock but, though highly persistent in some bands, does not occur over large areas of country. Garnet is present rarely in but small quantity.

As the schistosity of the Fordham gneiss has usually a very steep dip the exposures of this rock chiefly show cross sections of the banding.

It is difficult to give this rock formation a systematic name which exactly indicates its age. If it is of sedimentary origin it may be called Algonkian, but it can only certainly be said that it is Precambrian.

The Fordham gneiss forms the high anticlinal ridge which borders the New York shore of the Hudson River from Yonkers southward to Spuyten Duyvil and also that on the west side of the Bronx valley. The former ridge terminates on the south at Spuyten Duyvil and does not reappear on Manhattan Island. The latter is bifurcated at

the southern end and the western fork interrupted by a cross fold at the Harlem River, ends on Manhattan Island in the low ridge which borders Seventh avenue on the west at One Hundred and Fifty-fifth street, and disappears by pitching below the general surface level about half a mile southward. The eastern fork which, owing to the same cross fold, disappears beneath the limestone in Morrisania, reappears near the Bronx Kills in Mott Haven, where it forms a low anticlinal ridge interrupted by the Kills and represented on Manhattan Island by a few outcrops below high water mark at the foot of East 123rd and 125th streets which are now obliterated. Some narrow anticlinal ridges of Fordham gneiss are seen on the islands in the East River, notably Blackwell's, Ward's, N. Brother's and S. Brother's, and it is the only stratified crystalline rock at present exposed on Long Island, where it may be seen near the court house in Long Island City and at intervals on or near the shore of the East River from Ravenswood to Lawrence's Point.

PALAEOZOIC.

At the base of the metamorphosed Palaeozoic limestone and overlying the Fordham gneiss is a stratum of thinly bedded quartzite. This deposit occurs in southern Westchester county near Lowerre station in Yonkers at the Hastings marble quarry and about one-quarter mile south of Sparta on the shore of the Hudson River. It is well shown north of Peekskill along the east shore of Annsville Cove and in the valley of Peekskill Hollow Creek near Oregon. It does not exceed sixteen feet in thickness at Hastings. From the name of the southern locality this is called the Lowerre quartzite. Its age is probably Cambrian and possibly Georgian.

INWOOD LIMESTONE.

This is one of the most prominent formations of the region mapped and is a coarsely crystalline dolomite, distinctly bedded and containing at many localities the lime-magnesia silicates, diopside and tremolite, and occasionally tourmaline. Of its maximum thickness little is definitely known. At Tuckahoe a thickness of one hundred and

fifty feet is shown in section. In the Harlem River a thickness of about seven hundred feet is indicated.

The age of this limestone is probably Calciferous-Trenton. In the absence of fossils, which could not have withstood the extreme metamorphism, the exact age is indeterminate.

The crystalline limestone, though frequently well exposed, must often be traced by its absence as well as its presence. Its solubility in water containing carbonic acid renders it an easy prey to the elements, and its position is almost everywhere emphasized by low ground and usually by deep valleys. Throughout all the principal valleys small outcrops may be found, though usually for considerable distances it is buried in river gravel and alluvium. Where it has undergone the maximum of leaching the granular particles of limestone have disappeared entirely and in its stead we find a mass of aluminous and magnesian material, whitish, green with scales of prochlorite, red with peroxide of iron, and sometimes black with separated carbon. In these conditions it is often mistaken for clay or kaolin, and was thus reported from the railroad cutting at Morrisania, from the Blackwell's Island tunnel and from dredgings in the East River on the Middle Ground, Shell Reef and at the mouth of Newtown Creek. The same material was also found overlying the Fordham Gneiss in a deep boring on Tallman's Island near College Point. On the uplands the presence of limestone is evidenced by coarse yellowish white sand, consisting of partially dissolved cleavage fragments of the dolomite. This may be seen on the plain east of Inwood.

To the presence of the limestone is due the commercial prominence of New York, as all the navigable channels about the city are submerged valleys which owe their origin to the solution of the limestone along the lines of its outcrop and exposure. Without the submergence the limestone valleys would not be navigable channels and without the presence of limestone there would have been no valleys for the submergence to render navigable.

Long Island Sound owes its existence to the same cause.

MANHATTAN SCHIST.

This formation covers a larger area than any other within the limits of the Harlem sheet, and is the uppermost of the crystalline groups. The rock is essentially a mixture of biotite and quartz, frequently containing enough orthoclase to give it the composition of a gneiss. The principal accessory is garnet, which occurs in crystals varying from one-sixteenth to one-quarter of an inch in diameter. Occasionally much larger crystals are found. Fibrolite, kyanite and staurolite are also frequent accessories. The Manhattan schist has a marked schistosity which is frequently nearly parallel to the bedding, though not always.

The aspect of this formation is intimately affected by numerous igneous intrusions and injections of granitic and basic material, which, in some places, are so numerous as to predominate over the schist. The small masses are for the most part parallel to the schistosity, though in part, oblique to it. The larger areas usually have their longer diameters parallel to the strike of the schistosity. They are most abundant near the shores of Long Island Sound.

As the geologic map shows, in southern Westchester county, the Manhattan schist is the prevailing rock east of the limestone valley in which lies the New York and Harlem Railroad. This eastern area is closely folded and its bedding planes are mostly on edge. It terminates at its southern extremity in a closely pressed synclinal fold, pitching northward, which crosses Randall's Island and Ward's Island and ends at Little Mill Rock in Hell Gate. Flood Rock, which was removed in the improvement of Hell Gate channel, was part of this synclinal. On Mill Rock the schist is much injected with amphibolite and pegmatite.

The Manhattan schist is also the prevailing rock on New York Island.

IGNEOUS ROCKS.

Under this head are classified those rocks which are clearly intrusive in the Fordham gneiss, the Inwood limestone and the Manhattan schist.

So far as we know, they belong to one general period of igneous activity, the time of which can not be stated with greater exactness

than that it was posterior to the deposition of the Manhattan schists and therefore post-Hudson River, and prior to at least a part of the dynamic disturbance and crumpling of these rocks with which the intrusives have become schistose and even crumpled. The igneous rocks which occur in the pre-Cambrian and Palaeozoic within the region south of the 41st parallel of latitude may be classified as follows:

- Yonkers gneiss
- Granites, red and grey
- Pegmatite dykes, very coarse
- Harrison diorite
- Amphibolites and pyroxenites
- Serpentines, derived from basic intrusives.

YONKERS GNEISS.

In an article on the Metamorphic Strata of Southeastern New York*, the writer called attention to a reddish gneiss which appeared to be the lowest stratum in that terrane. From the microscopic structure of this rock, studied at certain localities, and from its apparent relations to the overlying gray gneiss, the conclusion was formed at that time that it was a metamorphosed sedimentary rock. More extended observations on this formation made during the summer of 1891 showed that it was not uniformly persistent as a basal member in southern Westchester county, and that it was not limited to the axes of the eroded anticlinals. The fact that it was overlain by a varying thickness of the gray gneiss was noticed by the writer at an early date but was attributed to unequal repetition of the gray gneiss by folding. Later investigations showed that a rock of the same composition occurred frequently as an intrusive either in veins and dikes or in bosses like the one at Sparta.

The Yonkers gneiss is technically a gneissoid granite. (Pl. V.) It is a well foliated rock consisting of quartz, reddish orthoclase and biotite with a little plagioclase. It is plainly intrusive in the Fordham gneiss and has become completely schistose.

*Am. Jour. Sci. III, Vol. XXXIX, p. 389.

In the particular area where this rock has its greatest extent it has been subjected to greater dynamic action than elsewhere and has been reduced to a gneissoid condition.

The persistence of reddish orthoclase in this rock suggests that it has sprung from a common source with the numerous dykes of red pegmatite and granite of similar composition which penetrate the schist and limestone in many points in Westchester county.

GRANITES.

Gray and reddish granites in small dykes oblique to the banding of the gneiss and schists are quite abundant, but of more frequent occurrence are lenses and injections of granite and pegmatite parallel to the banding of the schistosity. Bosses of pegmatite frequently occur in the Manhattan schist. A granite area of considerable size occurs near Union Corners and many have been found on New York Island, which are now built over and concealed from view. The small islands and reefs in the upper Bay and most of those in Long Island Sound owe their existence to intrusions of granite and other eruptives in the schist.

PEGMATITE DYKES AND BOSSES.

These are intrusions of coarse granitic material in dykes and bosses from one to ten feet in diameter. They are most abundant in the Manhattan schist.

HARRISON DIORITE.*

This rock is intrusive in the Manhattan schist in the town of Harrison and consists of orthoclase, plagioclase, quartz and hornblende. A smaller area of similar rock occurs at Ravenswood, L. I., where it outcrops in a long narrow ridge of northeasterly trend and is intrusive in the Fordham gneiss.

The mass which forms Milton Point near Rye has been subjected to much dynamic action and is well banded. The same rock is abundant along the shore of Long Island Sound between Portchester and Greenwich.

* H. Ries Trans. N. Y. Acad. Sci. 1895 Vol. xiv pp 80-86.

AMPHIBOLITES AND PYROXENITES.

Intercalated with the Manhattan schist and also with the beds of the Fordham gneiss we find at a great number of localities on New York Island and in Westchester county, hornblendic and augitic bands and lenses of limited thickness, usually only a few feet. In composition, these rocks resemble diorites and diabases, and in structure they are granular, and though they are at present in a foliated condition, their general characters suggest that they were originally eruptive rocks. Locally the magnesian silicates in these rocks are altered into epidote.

SERPENTINES.

A large number of observations have been made on these interesting rocks, the result of which are given in the following paper.

APPENDIX B

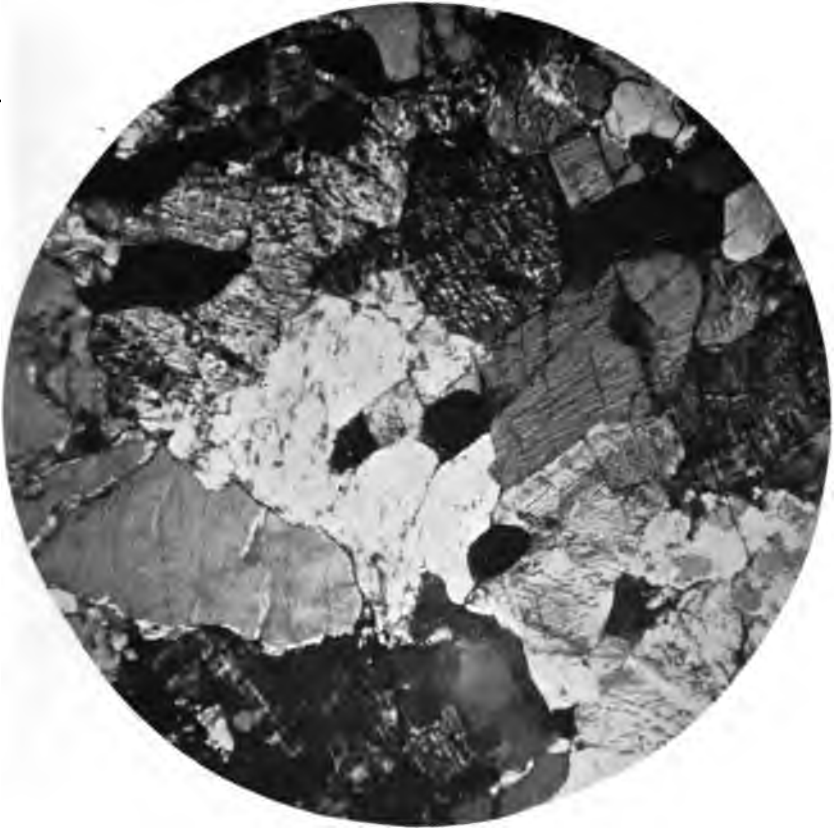
THE ORIGIN OF THE SERPENTINES IN THE VICINITY OF NEW YORK.

This paper was written in 1890, as part of a thesis for the degree of Doctor of Philosophy, at Columbia College. It has been withheld from publication a long time, in the hope of making it more complete, but an opportunity for this not having been offered, the paper is published in its original form, leaving to future time the completion of the investigation.

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PLATE I.



F. J. H. Merrill, Photo.

PRECAMBRIAN GRANITE, BREAKNECK MT., N. Y.

Photomicrograph in polarized light, enlargement 22 diameters.





PLATE III.



F. J. H. Merrill, Photo.

PRECAMBRIAN SHEARED GRANITE, LAKE MAHOPAC, N. Y.
Photomicrograph in polarized light, enlargement 22 diameters.

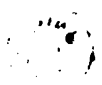


PLATE IV.



F. J. H. Merrill, Photo.

FORDHAM GNEISS. LEFURGY'S QUARRY, HASTINGS, N. Y.

Photomicrograph in polarized light, enlargement 22 diameters.

PLATE V.

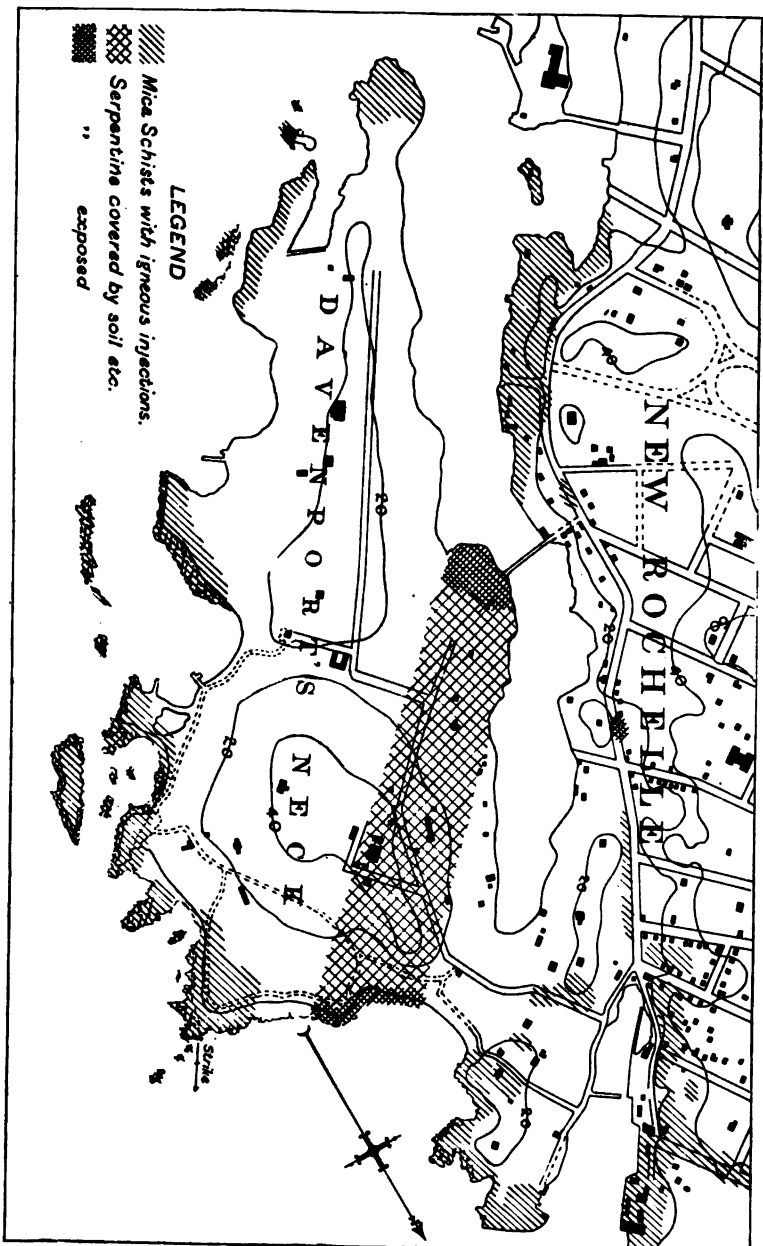


F. J. H. Merrill, Photo.

SHEARED GRANITE (YONKERS' GNEISS), HASTINGS, N. Y.

Photomicrograph in polarized light, enlargement 22 diameters.

PLATE VI.



Map of Davenport's Neck, New Rochelle, showing outcrops of serpentine and Ordovician mica schists. Unshaded areas are covered with Quaternary material.

Geology by F. J. H. Merrill.

PLATE VII.



F. J. H. Merrill, Photo.

**ALTERATION OF BRONZITE INTO SERPENTINE, DAVENPORT'S NECK, NEW
ROCHELLE, N. Y.**

Photomicrograph in polarized light, enlargement 23 diameters.



PLATE VIII.



F. J. H. Merrill, Photo.

ALTERATION OF ACTINOLITE INTO SERPENTINE, DAVENPORT'S NECK, NEW
ROCHELLE, N. Y.

Photomicrograph in polarized light, enlargement 22 diameters.



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THE ORIGIN OF SERPENTINE.

The origin of serpentine rocks was for a very long time a matter of controversy among geologists. They have been variously regarded as primary deposits, as plutonic rocks, as alteration products of rocks rich in anhydrous magnesian silicates and as the result of metasomatic change in rocks of any kind whatsoever, by the substitution of a hydrous magnesian silicate for some other silicate or carbonate.

About the middle of the present century Bischof and Gustav Rose expressed the unqualified opinion that all serpentines were of secondary origin, but as they were chemists rather than geologists and did not undertake to discuss the various geognostic problems involved in the study of these rocks, they were unable to account for all the phenomena associated with them, and their views, with which those of many other chemists and mineralogists coincided, were not accepted by geologists as conclusive.

Since most of the minerals from which serpentine was held to be derived, viz.: Olivine, enstatite, hornblende, augite, diallage and chondrodite, were believed to belong pre-eminently to eruptive rocks, it was considered inevitable that if the serpentines were all of secondary origin they must have been derived from igneous rocks, and as this hypothesis, in many cases, did not agree with the apparent stratigraphic conditions, it did not gain general acceptance. For example, many serpentines were found distinctly stratified and intimately associated with stratified crystalline rocks, some of which were limestones and obviously not of igneous origin. Dr. T. Sterry Hunt, who has discussed the origin of serpentines at great length,* while conceding the alteration of olivine and enstatite into serpentine in some cases, considers the association of serpentine with these two minerals to be an evidence of the simultaneous development of hydrous and anhydrous silicates from a magnesian sediment of chemical origin such as he ascribes to all crystalline stratified rocks. He also expresses doubt as to the igneous origin of many of the olivine rocks from which serpentine is held by others to be derived.

* Trans. Royal Soc. Canada, Vol. I, § IV, 1883.

In this expression of doubt as to the igneous origin of many magnesian silicate rocks, Dr. Hunt voices the sentiment of most field geologists who have made such rock masses a subject of study. All the common anhydrous silicates of magnesia are found to occur as individual rock masses or as constituents of them in the stratified crystalline terranes. In the opinion that anhydrous and hydrous silicates of magnesia are simultaneously developed from a magnesian sediment or magma, Dr. Hunt seems to stand alone and unfortunately for those who would give due weight to this hypothesis, does not advance any conclusive arguments in its behalf, nor does he record any observed facts in connection with serpentine, which make it apparent that this mineral is ever developed simultaneously with olivine or any other anhydrous magnesian silicate. Dr. Hunt alludes to the studies of Scheerer on the association of olivine and serpentine at Snarum, in Norway, which led that eminent scientist to assert his belief that the two silicates, hydrous and anhydrous, were formed simultaneously, because the alleged pseudomorphs were, in many cases, enclosed in masses of chromite.

According to the writer's understanding of Prof. Scheerer's article,* the only ground for rejecting the idea of pseudomorphism was that if the crystals of serpentine were produced by the hydration of pre-existing olivine an increase of bulk would ensue which must rend apart by expansion, the matrix of the altered crystal, many of the pseudomorphs being, as already stated, enclosed in masses of chromite which were unfractured and conformed exactly to the surface of the included crystal, which had the characteristic form of olivine though, in its external portion at least, it had the composition of a serpentine.

If this was Scheerer's reason for rejecting the idea of the pseudomorphism of the olivine into serpentine, his objection can not be accepted until it be proven that the chromite masses enclosing the serpentine were formed before the latter. As chromite masses are almost exclusively confined to serpentine rocks and in them, according to Tschermak, are formed by the segregation of the oxides of iron and chromium which are set free in the decomposition of the

* Pogg. Ann. Vol. LXVIII, p. 319.

anhydrous silicates of magnesia from the alteration of which he holds all serpentines to be derived, it may be that the chromite matrices of the Snarum pseudomorphs were deposited about them after their formation and were subjected to little or no expansive force, since, after the crystals were thus enclosed and protected from external agencies the process of serpentinization would cease.

Tschermak, in his memoir on the formation of serpentine,* quotes the words of Gustav Rose and Volger in their description of the Snarum crystals. Rose writes as follows:

"Of two crystals the surface is dark leek-green, soft and a perfect serpentine. On the freshly broken surface, however, the fact is evident that the serpentine is only from one-half to two lines (1-4mm.) thick and graduates into a very light, yellowish-green mass which traverses the crystal irregularly and encloses white areas with a high lustre, which are so hard that they can not be scratched with a knife. These also appear to have cleavage surfaces, but the whole mass is penetrated with fine fissures, and the small individual parts are brilliant on almost every side so that the true cleavage cracks can not be determined.

"Through another crystal passes a cleft about as thick as a sheet of paper, which is filled with very finely fibrous, highly transparent, leek-green chrysotile. From this spread out to right and left, fissures filled in a similar manner, which are nearly perpendicular to the principal crevice and which turn back upon themselves in ramifications which are sometimes very small and sometimes from one to one and one-half lines (2-3mm.) in thickness.

"Where the margins of these turn back quickly they often touch and intersect themselves and the whole mass between them, even when hard and brilliant, is colored green; where they meet each other at greater distances the included mass is white, of greater toughness than in the first crystal and of subconchoidal fracture.

"It is here evident that the whole mass of the crystal was penetrated by fissures which became filled with serpentine and from which the decomposition has proceeded in all directions."

* Sitz. Wien. Akad. LVI., 1st Abthell.

Prof. Volger from his examination of this material arrived at a similar conclusion.

Since the development of microscopic methods of research a large number of eminent investigators have studied the structure and optical properties of serpentine, and all, including Tschermak, Rosenbusch, Kalowsky, Websky, Wiik, Des Cloizeaux, Von Drasche and Fischer, are unanimous in considering it an alteration product of anhydrous magnesian silicates. Prof. Rosenbusch in his late work on rock-making minerals.* Epitomizes the latest knowledge of the subject as follows:—

“Serpentine, according to the mineral from which it is derived, has a fibrous or apparently lamellar structure. The apparent lamellæ may, however, only represent parallel bundles of fibres. The arrangement of the fibres is quite varied. They are sometimes parallel and sometimes confusedly felted and the optical characters of the fibres between crossed nicols change with their dimensions and their arrangement. In parallel aggregates, which are not too finely fibrous, one may recognize with certainty that they are biaxial with very large axial angles the negative bisectrix of which is perpendicular to the axis of the fibre which is the axis of least elasticity. These fibres have a weak refractive power (very near that of Canada balsam) and not inconsiderable double refraction. Chrysotile exhibits these properties very clearly. In the finely and confusedly fibrous aggregates very nearly complete compensation occurs so that these often appear to be isotropic.

“The mineral from which serpentine is most frequently derived is olivine. The alteration begins from the surface and from the crevices and leads to a fibrous structure with simultaneous separation of the iron content in the form of Fe_2O_3 , $2\text{Fe}_2\text{O}_3 + 3\text{H}_2\text{O}$ and Fe_3O_4 . The new structures of greenish to yellowish-green color are perpendicular to the crystal boundaries and the cracks. Since the alteration takes place from all the cracks (which cross each other confusedly) and from the sides simultaneously, an olivine in which the alteration into serpentine has begun, appears to have a reticulate structure. The serpentine strings form a network of which the meshes inclose olivine

* *Mik. Phys. der Pet. Wicht. Miner.* ste Aufl. pp. 557-559

still unaltered. As the process goes on, new fissures are cleft in consequence of the increase of volume associated with the alteration and thus render possible the constant increase of the new structures until the olivine is completely transformed."

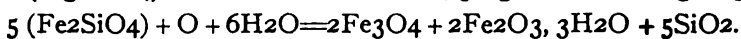
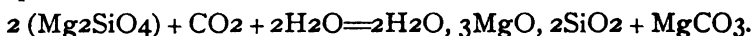
"In the alteration of hornblende and actinolite into serpentine the cleavage planes of amphibole and their oblique separations are very clearly brought out in the arrangement of the serpentine bundles. Between crossed nicols the lines of parallel fibres differentiate themselves in lively colors from the dark ground of the confusedly fibrous field, now running parallel to one another now intersecting one another at an angle of 124° to 125° , or forming rhombic figures with other angles and rectangles. There results in this way a structure which is characteristic in the highest degree and which Wiegand designated as lattice or window structure."

"Other serpentines, which, microscopically, occasionally show a schistose structure, under the microscope appear to consist of foliated masses which cross each other at right angles and so show a netted structure." "These serpentines appear to have resulted from the alteration of monoclinic pyroxenes."

From the alteration of the rhombic pyroxenes is produced both serpentine and bastite.

According to Tschermak the alteration of olivine into serpentine may be expressed as follows:—

Olivine consists of Mg_2SiO_4 and Fe_2SiO_4 combined in varying proportions.



A small portion of the MgO in the serpentine is replaced by FeO .

SERPENTINE LOCALITIES NEAR NEW YORK.

The serpentines in the vicinity of New York City are of two general classes:

A. Serpentine masses of large area.

B. Local developments of serpentine in crystalline magnesian limestones.

Of the first class the most extensive is that of Staten Island, N. Y., next in size are those of Rye and New Rochelle in Westchester County, N. Y., and that of Castle Point, Hoboken, N. J. A fifth area is to be found in New York City, on West 60th Street, between 10th and 11th avenues.*

Of the second class the most prominent examples are at Montville and Mendham in New Jersey and others are found in the continuation of the eastern belt of crystalline limestone through northeastern New Jersey and Orange and Putnam Counties in New York. The most extensive of these, on the east bank of the Hudson River near West Point, was described by Mather under the local name of "cotton rock."† He mentions besides, other localities in Putnam County, notably Huestis, Quarry, $4\frac{1}{2}$ miles northeast of Cold Spring. In Westchester County serpentine occurs in small masses at the Snowflake Marble Quarry at Pleasantville.

A third class might be constituted of the serpentine which is found in some of the iron mines of Putnam County. The serpentine pseudomorphs of the Tilly Foster Mine have been described at length by Prof. J. D. Dana. (*Am. Jour. Sci.* III. viii. pp. 454, 455.)

THE NEW ROCHELLE SERPENTINE.

The serpentine locality of Davenport's Neck at New Rochelle has long been known to geologists and mineralogists. Its position and stratigraphical relations are shown by the accompanying map. (Pl. VI.)

Prof. J. D. Dana from his observations on this serpentine concludes that it is associated with a limestone bed which is not now visible, having been removed by solution. The writer's study of the locality suggests that the serpentine is derived from magnesian silicate rocks intruded in the Manhattan schist. (*Am. Jour. Sci.* III. xxxix. p. 391.)

The only exposures now visible are at the northeastern and southwestern extremities near the water's edge, and the outcrops have been so long exposed to the weather that the process of serpentiniza-

* This locality is now covered with buildings.

† Cotton rock has been covered by the railroad embankment.

tion is complete and the serpentine itself is disintegrating. The northeastern outcrops are the most extensive and afford the most information concerning the origin of the deposit. The northernmost outcrop is dark green in color, of very coarse texture and has been derived very largely from bronzite, small quantities of which still remain. Succeeding this to the south is a massive rock consisting of hornblende and garnet covering an area of about one hundred and fifty square feet; followed in turn by more of the coarse serpentine some of which is reddened by the oxidation of its iron content. For one hundred and fifty feet or more, the rock is not visible and then succeeds a fine grained, light green, rather porous serpentine mass which forms a small promontory near the middle of the area. This is overlain with a semblance of stratification which does not harmonise with that of the neighboring gneisses, by a reddish serpentine rock containing actinolite in various stages of alteration. In this portion of the deposit are thick veins of deweylite and chalcedony and a considerable amount of crystalline calcite. In the opinion of the writer the calcite is a by-product of the serpentinization.

Microscopic study of the New Rochelle serpentine suggests that it is chiefly derived from amphibole and bronzite. The occurrence of fibrous amphibole and bronzite or enstatite in connection with the serpentine of this locality has already been recorded by Prof. Dana. In thin sections examined by the writer, crystals of bronzite may be seen in which serpentine has been formed along the transverse crevices. In these bronzite crystals are found also irregular masses of pleonast, the relations of which to the surrounding mass suggest that they are of secondary origin. (Pl. VII.)

Where actinolite has been the source of the serpentine the unaltered mineral verges through a zone of brown, partly decomposed material into the finely fibrous serpentine which contains a very large proportion of minute crystals of magnetite. (Pl. VIII.)

The change from actinolite into serpentine does not seem to be so direct as that from bronzite. The zone of discoloration appears to represent an intermediate stage in which the excess of iron is removed from chemical combination with the silica and set free.

With regard to the genesis of the minerals from which this serpentine is derived but little can be predicted; there seem to be, however, some reasons for not considering them of sedimentary origin. While the writer does not question the formation of amphibole and bronzite from sedimentary deposits, the evidence of such origin in this case is not conclusive. It is impossible at present to predicate with certainty the geological character of the primitive rock. The outcrops are so limited in extent and so far advanced in alteration that the writer has found no clue to guide him in his investigation of this point. It is safe to say however that the primitive rock mass was different from any now known in an unaltered condition in this terrane. A fragment of bronzite rock was found by Mr. J. I. Northrup in the debris removed from one of the shafts of the new Croton Aqueduct near Tarrytown and this may have been a part of such rock mass as that which gave being to the New Rochelle serpentine, but unfortunately nothing can be ascertained concerning its source.

The origin of the deposits from which this serpentine and its congeners have been derived remains the most important question connected with their history, and unfortunately we can only reason upon analogy in discussing it. In all probability the magnesian silicate rocks which by their alteration have yielded these serpentines were similar in their origin to the amphibolites and pyroxenites which abound in Westchester county. In modern sedimentation no evidence has been recorded of an alteration of conditions which would yield in small quantity a deposit having the composition of a magnesian silicate when immediately before and after it the sediment was chiefly composed of silica and aluminous silicates. In *composition* the amphibolite and pyroxenite beds of the Manhattan Group bear the same relation to the strata which enclose them as the intrusive mass of the Palisades bears to the beds of sandstone and arkose between which it is now included. There is nothing but their somewhat foliated condition to suggest that they are of sedimentary origin and this characteristic has been shown to result frequently from dynamo-metamorphism..

The former hypothesis that serpentine is largely derived from the alteration of magnesian limestone or dolomite does not seem to be

supported by recent investigations. In the literature to which the writer has access, the only recorded instance of such derivation is that of a pseudomorph collected from the Tilly Foster Mine, the form and structure of which suggested to Prof. J. D. Dana that it had been derived from a crystal of dolomite.* Mr. George P. Merrill has happily suggested, in the case of the Montville serpentine, that the excess of silica set free in the decomposition of the diopside has to some extent combined with the magnesia of the enclosing dolomite and thus formed a serpentine in addition to that formed by the alteration of the pyroxene. It is evident that a dolomitic limestone can only yield serpentine through the action of silicated waters, while the magnesia-iron minerals above mentioned will yield serpentine under the influence of ordinary atmospheric waters.

In the present opinion of the writer the origin of the New Rochelle serpentine has been as follows:

The mica schists were formed by sedimentation and metamorphism. The amphibolites and other magnesian silicate rocks were intruded and by subsequent compression attained their foliated structure. Orographic disturbance subsequently brought the strata into their present attitude and finally erosion removed the covering of mica schist and laid bare the truncated folds. Atmospheric waters then had free access to the magnesian silicates and the process of de-ferrugination and hydration began and resulted in the formation of the serpentine. The excess of silica was carried off and deposited in the form of chalcedony of which large masses and minute veins occur in the deposit, and the excess of iron appears as magnetite and chromite, while according to the combinations into which the magnesia entered, various varieties of serpentine were formed, together with magnesite, talc and deweylite.

The writer is not disposed to attribute any very great geological antiquity to the serpentine. Under favorable conditions it forms quite rapidly. At Stony Point on the Hudson River, the writer has observed a surface of peridotite, which had apparently been swept clean by the ice sheet, covered by a layer of serpentine about one-

*Since the above was written some material has been given to the writer by Dr. Hunt of the Brooklyn Institute, which in appearance corroborates Prof. Dana's conclusion.

fourth of an inch thick. As in this case only a small portion of the rock had by its decomposition yielded serpentine, and the layer observed by the writer had been leached out of the rock, it is reasonable to infer that a considerable depth of the rock might since the glacial epoch have been changed into serpentine had all of its minerals yielded that alteration product.

From what is known of the erosion of the region about New York it may be inferred that the rock mass which yielded the New Rochelle serpentine was exposed to the action of atmospheric agencies not earlier than the Mesozoic age.

THE STATEN ISLAND SERPENTINE.

The general characteristics and extent of this deposit have been described by Dr. N. L. Britton, but the question of its origin is not entirely settled. Throughout most of its extent this area has suffered so complete an alteration as to yield no traces of the mineral from which it was derived. Mr. Gratacap records the presence of traces of unaltered hornblende in specimens from Bard avenue and elsewhere. In a well boring made through the serpentine some fibrous amphibole or actinolite was found in a comparatively unaltered condition. (Trans. N. Y. Acad. Sci., Vol. I, p. 58.) Dr. A. A. Julien (loc. cit.) states that he has found traces of unaltered hornblende in Staten Island serpentine.

In none of the material which the writer has examined has he found unaltered particles of the primary mineral, but there is frequently present a *reticulate structure similar to that which Rosenbusch has described and illustrated as characteristic of serpentine derived from olivine*. In a large number of sections examined by the writer the "lattice structure" characteristic of serpentine derived from hornblende was wanting, the angles between the cracks being more nearly those of pyroxene than of hornblende. It is not improbable that more than one magnesian silicate has contributed to its origin.

In the process of alteration limonite and free silica were the chief by-products. The former appears in the once extensive bed of limonite which has been used as an iron ore, and the latter in the groups of quartz crystals which so frequently occur in the former.

If there were any considerable amount of alumina in the primitive minerals it was probably carried off and deposited with the limonite. The manner in which this ore originated accounts for its freedom from sulphur and phosphorus.

THE SERPENTINE OF RYE AND HOBOKEN.

After studying a large amount of material from these two localities the writer is unable to contribute any new facts regarding their origin. The outcrops are so far decomposed as to afford no traces of the primitive mineral. Dr. A. A. Julien (*loc. cit.*) mentions his discovery of traces of hornblende in serpentine from Hoboken.

SERPENTINES ASSOCIATED WITH LIMESTONES.

The distribution of these serpentines has already been described. The deposits at Montville, N. J., are of much interest. Here the serpentine is derived from segregated masses of diopside enclosed in the magnesian limestone.

Mr. G. P. Merrill's monograph on the subject* shows very clearly the chemical relations of the primitive mineral and its alteration product, and discusses one of the few cases of the formation of serpentines from the magnesia of a dolomitic limestone. At Mendham the serpentine is of similar origin, to that of Montville and pyroxenes easy of decomposition occur throughout this belt of limestone of which the extent has already been mentioned.

In Westchester County, N. Y., at Pleasantville and elsewhere the serpentine is likewise derived from magnesian silicates, chiefly of the pyroxene group but occasionally having the characteristics of an olivine.

* *Proceed. U. S. Nat. Mus., Vol. XI.*

APPENDIX C

Preliminary list of Public Geological and Mineralogical collections in the United States and Canada.

United States.

ALABAMA.

University of Alabama, University

Eugene A. Smith, Professor of Mineralogy and Geology (also state geologist). Collections of the State geological survey are included; they comprise 2000 mineral, and 20,000 geological specimens.

Alabama polytechnic institute, Auburn

P. H. Mell, professor of geology and botany. Collection of 1000 specimens.

Southern university, Greensboro

E. L. Brown, professor of chemistry and physics. Collection of 1000 specimens.

Howard college, East Lake

G. W. Macon, professor of botany and zoology. Collection of 500 specimens.

ARIZONA.

University of Arizona, Tucson

Pres. Theodore B. Comstock, instructor in geology. The collections, comprising 3500 specimens, include those of the former territorial geologist and the Arizona collection at the World's Fair.

ARKANSAS.

Arkansas industrial university, Fayetteville

J. F. McNeil, professor of biology.

Hendrix college, Conway

G. H. Burr, professor of natural and physical science. Collection of 800 specimens.

CALIFORNIA.

University of California, Berkeley

Joseph LeConte, professor of geology. Collection of 55,000 specimens of minerals and rocks.

Leland Stanford jr. university, Stanford University

John C. Branner, professor of geology. Collection of 23,000 specimens of fossils, minerals, and ores.

Santa Clara college, Santa Clara

A. Cichi, professor of chemistry and physics. Collection of 3500 specimens.

University of Southern California, University

O. P. Philips, professor of natural science.

Golden Gate Park Museum, San Francisco

C. P. Wilcomb, curator. General collection of 2000 specimens.

State Mining bureau, San Francisco

J. J. Crawford, State mineralogist. Mineralogical and economic collections of 15,000 specimens

COLORADO.

State school of mines, Golden

Horace B. Patton, professor of geology and mineralogy. Collections consist of rocks, 2000 specimens, minerals 6000, economic products 2000, fossils 2000.

Colorado college and Cutler academy, Colorado Springs

F. W. Cragin, professor of geology and paleontology.

University of Denver, Denver

William C. Strong, professor of natural sciences. Rock specimens 300, minerals 2000.

University of Colorado, Boulder

professorship of geology vacant. Collection of 1300 rocks, 500 rock sections and a small collection of fossils.

State agricultural college, Fort Collins

William P. Headden, professor of geology and chemistry. Collection of 1000 specimens.

Colorado Scientific society, Boston building, Denver
Collections of minerals, rocks and fossils.

State Commissioner of Mines, Denver
Harry A. Lee, commissioner. Collection of minerals and ores from the state.

Colorado fuel and iron company, Boston building, Denver
R. C. Hills. Collection of coals from Colorado, Wyoming and New Mexico. Also a mineral collection and 800 specimens of eruptive rocks from Colorado and New Mexico, the property of Prof. Hills.

CONNECTICUT.

Yale university, New Haven
Geological faculty: H. S. Williams, O. C. Marsh, Geo. J. Brush, A. E. Verrill, E. S. Dana, S. L. Penfield, Chas. E. Beecher and L. V. Pirsson. The Peabody museum contains the best collection of vertebrate fossils in the country. No estimate of the collections given, but they are among the foremost in the country.

Wesleyan university, Middletown
William N. Rice, professor of geology. Collections contain 11,500 specimens, which include 300 mineral species, 4000 Paleozoic, 800 Mesozoic, 2000 Cenozoic fossils.

Trinity college, Hartford
W. H. C. Pynchon, instructor in natural science.

Storrs agricultural college, Storrs
B. F. Koons, president, instructor in geology. Collection of 1000 specimens.

Scientific association of Meriden, Meriden
Robert Bowman, curator. Collection of 1200 specimens.

DELAWARE.

Society of Natural History of Delaware, Wilmington
Mrs. G. Yeatman Pyle, corresponding secretary. Collection of 1600 specimens, chiefly minerals.

State college for colored students, Dover
No instructor. Small collection.

Delaware college, Newark

T. R. Wolf, professor of chemistry. Collection of 800 specimens.

DISTRICT OF COLUMBIA.

Columbian university, Washington

Dr. George P. Merrill, professor of geology. No estimate of collections.

Howard university, Washington

Richard Foster, professor of natural history. 5000 specimens.

Georgetown university, Washington

A. J. Donlon, S. J., professor. Collection of 6600 specimens.

United States national museum (Smithsonian institution), Washington

Stephen P. Langley, Secretary of the Smithsonian Institution: Keeper Ex-officio.

Chas. D. Walcott, Acting Assistant Secretary of the Smithsonian Institution, in charge of the U. S. National Museum.

Frederick W. True, Executive Curator.

Contains the best and most extensive collections in the United States. The mineral collections are arranged in systematic and comparative exhibition series for the public, and a study series for students: this contains type specimens, etc., and duplicates series from which exchanges, etc., are made.

Geological collections include: exhibition, 23,097; study, 28,911; microscopical slides 4700; duplicates 15,541; total, 72,249. Paleontological collections include several hundred thousand specimens, 58,000 type lots, and much material from government geological surveys.

FLORIDA.

Rollins college, Winter Park

Eva J. Root, professor of natural science and French. Collection of 700 specimens.

GEORGIA.

University of Georgia, Athens

H. C. White, professor of chemistry. Collection of 6000 specimens.

Emory college, Oxford

H. S. Bradley, professor of chemistry and physics. Collection of 10,000 specimens

Mercer university, Macon

J. F. Sellers, professor of physics and chemistry. Collection of 5000 specimens

Bowdon college, Bowdon

C. O. Stubbs, professor of chemistry, astronomy and philosophy. Collection of 700 specimens

IDAHO.**University of Idaho, Moscow**

C. P. Fox, professor of mineralogy. Collection of 500 specimens

ILLINOIS.**University of Chicago, Chicago**

T. C. Chamberlin, head professor of geology. Collections, estimated between 200,000 and 300,000 specimens, include Dr. Washburn collection, rich in Niagara forms; Dr. James collection, rich in Cincinnati types; ores and economic specimens from World's Fair and Field museum; rock series from the west and from Europe

Northwestern university, Evanston

Oliver Marcey, professor of geology. Mineral and rock specimens, 6000; fossils 3000, and much material from World's Fair not yet arranged

Blackburn university, Carlinville

Geo. F. Weida, professor of chemistry and physics. Collection of 33,000 specimens

University of Illinois, Urbana

Chas. W. Rolfe, professor of geology. Minerals and rocks 5000 specimens, fossils 50,000

Austin college, Effingham

W. J. Brinckley, professor of sciences. Collection of 1200 specimens

Knox college, Galesburg

Albert Hurd, professor of chemistry and zoology.* Collection of 3400 specimens

Augustana college, Rock Island

J. A. Uddin, professor of natural sciences. Collection of 3000 specimens

Hedding college, Abingdon

A. A. Waters, professor of chemistry, botany and zoology. Collection of 2000 specimens

Wheaton college, Wheaton

J. B. Russell, professor. Collection of 1500 specimens

Illinois Wesleyan university, Bloomington

R. O. Graham, professor of chemistry. Collection of 1000 specimens

Carthage college, Carthage

C. C. O'Harra, professor of natural science. Collection of 1000 specimens

Greer college, Hoopeston

S. W. Dixon, professor of mathematics and mental science. Collection of 672 specimens

Northwestern college, Naperville

L. Umbach, professor of natural science. Collection of 500 specimens

Lincoln university, Lincoln

A. E. Turner, professor of chemistry. Collection of 500 specimens

Chicago academy of sciences, Chicago

Frank C. Baker, curator. Collection of 10,000 specimens include many type specimens from the Niagara and Cincinnati groups

State museum of natural history, Springfield

Wm. F. E. Gurley, state geologist. Collections include 5000 paleontological species and 2500 forms of rocks and minerals

Field Columbian museum, Chicago

F. J. V. Skiff, director. Collections include paleontology 5000 specimens; meteorites, specimens from 180 falls and 60 casts; mineralogy 5000 specimens; building stone 400 polished slabs; lithology 15,000 specimens; also large collections of precious and semi-precious stones and in economic geology

INDIANA.**Indiana university, Bloomington**

V. F. Marsters, professor. In 1883 fire destroyed a large collection. Collections now contain 225 varieties of minerals, 250 crystal models, and 5000 paleontological specimens

Franklin college, Franklin

D. A. Owen, professor of biology. Collection consists of 35,000 specimens, largely the gift of S. S. Gorby

Purdue university, Lafayette

Stanley Coulter, professor of biology. Collection contains about 20,000 specimens

Taylor university, Upland

S. Collett, professor of natural science. Collection of 1500 specimens

Brookville society of natural history, Brookville

A. W. Butler, secretary. (No estimate given) Fair sized local collection

Hanover college, Hanover

Glenn Culbertson, professor. Local paleontological collection of 500 specimens. Hudson river, Clinton, Niagara and Corniferous groups well represented

Wabash college, Crawfordsville

Donaldson Bodine, professor of geology and zoology. Collections include 3000 mineralogical, 3000 paleontological (some types), also economic collection and fossil vertebrates

INDIAN TERRITORY.**Indian university, Bacone**

M. L. Brown, principal. Collections are small

IOWA.

Davenport Academy of Natural Sciences, Davenport

W. H. Barris, curator

State university of Iowa, Iowa City

Samuel Calvin, professor of geology, also State Geologist. Collections include 30,000 specimens, chiefly from state survey. Calvin collection of American and European fossils, 6000 specimens; and Hornaday collection of vertebrate fossils

Cornell college, Mount Vernon

Wm. H. Norton, professor of geology. Collection contains 11,000 specimens

Amity college, College Springs

H. K. Holcomb, professor of biology and chemistry. Collection of 4500 specimens

Upper Iowa university, Fayette

Bruce Fink, professor of botany and zoology. Collection of 2000 specimens

Iowa college, Grinnell

H. W. Norris, professor of biology. Collection of 2000 specimens

Wartburg teachers' seminary and academy, Waverly

Frederick Lutz, president. Collection of 1181 specimens

Western college, Toledo

A. G. Leonard, professor of biology and chemistry. Collection of 600 specimens

Muscatine academy of science, Muscatine

Samuel McNutt, president. A valuable collection was destroyed by fire in 1896. New collections started which now contain about 250 specimens

KANSAS.

University of Kansas, Lawrence .

Samuel W. Williston and Erasmus Haworth, professors of geology. Geological and mineralogical collections contain about 100,000 specimens

Baker university, Baldwin

C. S. Parmenter, professor of natural history

Museum contains 10,000 geological and 3600 mineralogical specimens

Washburn college, Topeka

G. P. Grimsley, professor of botany and zoology. Collection of 4000 specimens

Kansas state agricultural college, Manhattan

John H. Failger, professor of chemistry. Collection of 4000 specimens

Kansas Wesleyan university, Salina

Alfred W. Jones, professor of biology. Collection of 1200 specimens

Bethany college, Lindsborg

J. E. Welin, professor of natural history. Collection of 550 specimens

Midland college, Atchison

C. B. Knox, professor of chemistry, physics, etc. Collection of 500 specimens

College of Emporia, Emporia

W. H. Maurer, professor of chemistry and physics. Collection of 500 specimens

KENTUCKY.**Kentucky university, Lexington**

Alfred Fairhurst, professor of natural science

Center college of Kentucky, Danville

J. C. Fales, professor of biology. Collection of 1670 specimens

Bethel college, Russellville

James L. Lake, professor of chemistry and physics. Collection of 1500 specimens

Central university of Kentucky, Richmond

R. M. Parks, professor of chemistry. Collection of 1000 specimens

Ogden college, Bowling Green

J. C. Lewis, professor of chemistry. Collection of 800 specimens

Polytechnic society of Kentucky, Louisville

E. A. Grant, secretary (No estimate given). Collections include The 'Troost cabinet', 'Octavia Allan Shereve memorial cabinet,' part of the Dr. J. Lawrence Smith collection, etc.

State geological department, Frankfort

C. J. Norwood, mine inspector and curator. State economic collection and a small paleontological collection

LOUISIANA.

Louisiana state university, Baton Rouge

W. W. Clendenin, professor of botany. Collection of 10,000 specimens

Tulane university, New Orleans

J. W. Caldwell, professor of chemistry. Collection of 5200 specimens

New Orleans university, New Orleans

L. G. Adkinson, professor of mental and moral philosophy. Collection of 500 specimens

MAINE.

Colby university, Waterville

William S. Bayley, professor of mineralogy and geology. Collection of 6750 specimens

Bowdoin college, Brunswick

L. A. Lee, professor of biology. Collection of 6000 specimens

Maine state college, Orono

F. L. Harvey, professor of natural history. Collection of 900 specimens

MARYLAND.

Johns Hopkins university, Baltimore

William B. Clark, professor of geology and state geologist. Extensive collections, but no estimate given

Rock Hill college, Ellicott City

Brother Blandin, professor of physical geography. Collection of 2000 specimens

Western Maryland college, Westminster

S. Simpson, professor of chemistry. Collection of 800 specimens

Maryland geological survey, Baltimore

Wm. B. Clark, State geologist. Collections include building stones, clays, ores, minerals, fossils and rock formations of the state.

MASSACHUSETTS.**Leominster Public Museum, Leominster**

E. G. Davis, curator. Collection of about 1000 specimens

Smith College, Northampton

Harris G. Wilder, professor of zoology. Small collections

Worcester Natural History Society, Worcester

Dill Ten Eyck, custodian. Collection of about 4000 specimens

Boston Society of Natural History, Boston

Geological collections are in charge of Prof. Alpheus Hyatt and W. O. Crosby. The collections are extensive in all departments of geology

Harvard university, Cambridge

Nathaniel S. Shaler, Professor of geology, William Morris Davis, Assistant Professor. Collections include 2400 geological, 12,000 paleontological, 11,000 petrographical specimens, 5000 thin sections for the microscope and 15,000 mineralogical specimens

Massachusetts institute of technology, Boston

Wm. H. Niles, professor of geology. Collections extensive, but no estimate given

Amherst college, Amherst

B. K. Emerson, professor of geology. Collections estimated at from 40,000 to 50,000 specimens

Williams college, Williamstown

T. Nelson Dale, instructor in geology. Collection of 2875 specimens

College of the Holy Cross, Worcester

F. A. Rousseau, professor of mechanics and astronomy. Collection of 800 specimens

Peabody academy of science, Salem

J. H. Sears, curator of mineralogy and geology. Collections include 960 mineral, 2000 historical geology, 725 historical geology of Essex County, 350 minerals of the state, 1575 thin sections, photographs, etc. Issues bulletins, etc.

Cape Ann scientific and literary association, Gloucester

Thomas Conant, M. D., president. Collection of 1000 specimens

Natural history, museum, Springfield

William Orr, jr, curator. Collections include 650 geological specimens and 530 mineralogical

MICHIGAN.**University of Michigan, Ann Arbor**

Israel C. Russell, professor of geology. Collections, estimated to contain 100,000 specimens include Lederer collections of 2500 European minerals; a rich collection from Michigan; collections of state geological survey; White collection of 6000 specimens; Rominger collection of 25,000 specimens

Hillsdale college, Hillsdale

W. H. Munson, professor of biology and chemistry. Collection of 7853 specimens

Alma college, Alma

Charles A. Davis, professor of biology and chemistry. Collection of 5000 specimens

Albion college, Albion

C. E. Barr, professor of biology. Collection of 4200 specimens.

Michigan mining school, Houghton

M. E. Wadsworth, director and professor of geology. Collections include paleontological 3000, mineralogical 30,000, lithological 13,500, thin sections 700 specimens

State geological survey, Houghton

Lucius L. Hubbard, state geologist. Collection of 18,000 specimens, chiefly rocks and ores from the state

MINNESOTA.**University of Minnesota, Minneapolis**

C. W. Hall, professor of geology and mineralogy. Collection of 34,500 specimens including minerals, rocks and fossils of the state

Carleton college, Northfield

L. W. Chaney, jr, professor of biology. Collection of 4000 specimens

Hamline university, St. Paul

H. L. Osborn, professor of biology. Collection of 1500 specimens

Gustavus Adolphus college, St. Peter

J. A. Edguist, professor of zoology. Collection of 1000 specimens

State geological and natural history survey, Minneapolis

N. H. Winchell, state geologist. Collection of rocks, mostly crystalline from the state, 5719 specimens

MISSISSIPPI.**University of Mississippi, University**

T. O. Mabry, professor of natural history. Collection of 10,000 specimens

Mississippi agricultural and mechanical college, Agricultural College

George C. Crulman, professor of biology. Collection of 2500 specimens

MISSOURI.**Christian University, Canton**

A. J. Youngblood, professor of natural science. Collection of 500 specimens

University of state of Missouri, Columbia

G. C. Broadhead, professor of geology and mineralogy. (Fire in 1892 destroyed a valuable collection) Collection of 1300 specimens

Pritchett school institute, Glasgow

W. N. Holmes, professor of physics and chemistry. Collection of 10,000 specimens

School of Mines and Metallurgy, University of Missouri, Rolla

C. DeKalb, professor of mining and metallurgy. Collection of 4000 specimens

Drury college, Springfield

E. M. Shepard, professor of biology. Collection of 2000 specimens

Westminster college, Fulton

J. W. Lyle, professor of chemistry and zoology. Collection of 2000 specimens

Central college, Fayette

J. W. Kilpatrick, professor of biology. Collection of 1000 specimens

Washington university, St. Louis

G. Hambach, professor of mining and metallurgy. Collections chiefly paleontological, include Shumard and Hambach collections. The latter rich in Blastoidae and Paleozoic Echini

State geological survey, Jefferson City

Charles R. Keyes, state geologist. Collection of 32,000 specimens from the state

MONTANA.**Montana College of agriculture and mechanic arts, Bozeman**

F. W. Traphagen, Ph. D. professor of chemistry, physics and geology. Collection strong in fossils and ores

College of Montana, Deer Lodge

F. N. Guild, professor of chemistry. Collection of 500 specimens from the state, chiefly ores

NEBRASKA.

University of Nebraska, Lincoln

Erwin H. Barbour, professor of geology and state geologist.
No estimate given. Collections large and include those of the
State Survey

Creighton university, Omaha

C. Borgmeyer, professor of philosophy and mathematics. Col-
lection of 10,000 specimens

Nebraska Wesleyan university, University Place

C. Fordyce, professor of natural science. Collection of 2000
specimens

Doane college, Crete

J. H. Powers, professor of biology. Collection of 800 specimens

NEVADA.

State university, Reno

W. McN. Miller, professor of anatomy and physiology. Collec-
tion of 1000 specimens

NEW HAMPSHIRE.

Keene High School, Keene

F. R. Miller, sub-master of the school, is in charge of the col-
lection which numbers about 2100 specimens

Dartmouth college, Hanover

Chas. H. Hitchcock, professor of geology and mineralogy
Mineral collection consists of 2,000 specimens
Geological collection consists of 4,000 specimens

**New Hampshire college of agriculture and the mechanic arts,
Durham**

Clarence M. Weed, professor of zoology and entomology. Col-
lection of rocks of the state and a reference collection of min-
erals

Keene natural history society, Keene

George A. Wheelock, president. Collection of 1000 specimens

NEW JERSEY.

State Geological Survey, Trenton

John C. Smock, state geologist. Collection illustrating several thousand economic products of the state

University of New Jersey, Princeton

William B. Scott, professor of geology. Collection of 25,000 specimens

Rutgers college, New Brunswick

Albert H. Chester, professor of chemistry and mineralogy. Collection of 11,500 specimens

NEW MEXICO.

New Mexico college of agriculture and mechanic arts, Mesilla Park

E. O. Wooton, professor of botany. Collection of 700 specimens

NEW YORK.

Binghamton Academy of Science, Binghamton

N. M. Pierce, president. This society owns several collections but they are not at present arranged for exhibition

Glen Island Museum of Natural History, New Rochelle

Lewis M. McCormick, curator. Collections are small

Ward's Natural Science Establishment, Rochester

Henry A. Ward, president. Collections approximate 340,000 specimens

Canisius College, Buffalo

M. Bischoff, professor of philosophy and astronomy. Collection of 2000 specimens

Cornell university, Ithaca

Ralph S. Tarr, A. C. Gill and Gilbert D. Harris, assistant professors of geology. Collection of 100,000 specimens

Columbia university, New York City

J. F. Kemp, professor of geology. Collection of 75,000 specimens

University of Rochester, Rochester

H. LeR. Fairchild, professor of geology. Collections include: mineralogical 5000; geological 3000; and paleontological 25,000 specimens

Union University, Schenectady

Chas. S. Prosser, professor of geology and paleontology. Collections include: mineralogical 4000; lithological 1010; paleozoic fossils 870; mesozoic 300; cenozoic 200; total 7380 specimens

Hamilton college, Clinton

Chas. H. Smyth, jr, professor of geology and mineralogy. Collections include: mineralogical 10,000; 2500 fossils and rocks illustrating geology of New York, 1750 illustrating geology of United States and 600 silurian fossils from Europe

Vassar college, Poughkeepsie

Wm. B. Dwight, professor of natural history. Collections of 10,000 specimens, include many vertebrate fossils of Tertiary age from Bad Lands, Nebraska

Rensselaer Polytechnic institute, Troy

John M. Clarke, professor of geology. Collection of 18,700 specimens

University of the City of New York, New York

J. J. Stevenson, professor of geology. Collection of 17,000 specimens.

United States Military academy, West Point

S. E. Tillman, professor of chemistry. Collection of 10,000 specimens

Alfred university, Alfred

A. R. Crandall, professor of natural history. Collection of 10,000 specimens

Colgate university, Hamilton

A. P. Brigham, professor of geology and natural history. Collection of 5000 specimens

Manhattan college, New York

Brother Elzear, professor. Collection of 5000 specimens

Polytechnic institute, Brooklyn

David H. Cockran, curator. Collection of 4500 specimens

College of the City of New York, New York

W. Stratford, professor of natural history. Collection of 3070 specimens

St Lawrence university, Canton

Professorship in geology is vacant. Collection of 2000 specimens

Niagara university, Niagara university

P. MacHale, professor. Collection of 2000 specimens

Syracuse university, Syracuse

E. C. Quereau, professor of geology. Collection of 1500 specimens

American museum of natural history, at Central Park, New York city

R. P. Whitfield, curator in geology. (No estimate given.)
This museum contains one of the largest and best collections of rocks, fossils, minerals and gems in the world

Brooklyn institute of arts and sciences, Brooklyn

D. S. Martin, dep't of geology. Collections include Braun collection of fossils and rocks; R. P. Stevens collection, Gebhard collection from Schoharie, N. Y. (No estimate given)

Natural science association of Staten Island, New Brighton

Arthur Hollick, secretary. Collection of 500 paleontological and 200 lithological specimens

Buffalo society of natural sciences, Buffalo

Fred K. Mixer, director. Collections include 2165 paleontological and 710 lithological specimens. Good local collections

Hobart college, Geneva

(Professorship in the department of geology is vacant.) Geological and mineralogical collections are extensive but no estimate was given

New York state museum, Albany

F. J. H. Merrill, Ph. D., director. Collections on exhibition are estimated to include: Mineralogical, Kunz, Beck, Gebhard and Emmons collections, total 8200 specimens, 300 species. Paleontological, 13,100 specimens invertebrate fossils from state geological survey, 3600 specimens foreign fossils, an Irish elk, the Cohoes mastodon skeleton and Ward's series of casts of fossils. Lithological, rocks from state survey 2800; Carboniferous, 300; Rosenbusch collection of massive rocks 500, and marbles 51 specimens. Total 28,553 specimens

Economic collection (in construction), 600 specimens

Synoptical collection (in construction), 425 specimens. Large collections stored

Long Island historical society, Brooklyn

M. E. Ingalls, assistant curator. Collections include 600 specimens from glacial drift of Long Island. Rocks of Manhattan Island, 200 specimens, N. Y. State minerals and fossils 900 specimens. Charts and specimens from many well borings

State normal college, Buffalo

I. P. Bishop, professor of natural science. Collections include 300 mineral and 500 fossil species

NORTH CAROLINA.**State Museum, Raleigh**

H. H. Brimley, curator. Extensive collections from the state

University of North Carolina, Chapel Hill

Collier Cobb, professor of geology. Collection of 2860 specimens

Davidson college, Davidson

Henry Louis Smith, professor of geology and mineralogy. Collections contain 10,000 or 11,000 specimens

NORTH DAKOTA**University of North Dakota, University**

E. J. Babcock, professor of chemistry. Collection of 1800 specimens

Red River Valley university, Wahpeton

M. V. B. Knox, professor of biology. Collection of 2000 specimens

North Dakota agricultural college, Fargo

W. H. Whalen, professor of geology. Collection of 530 specimens

OHIO**Ohio state university, Columbus**

Edward Orton, professor of geology and state geologist. Collection of 20,000 specimens. Excellent economic collection from the state

Adelbert college, Cleveland

Harry P. Cushing, associate professor of geology. Collection of 12,000 specimens

Antioch college, Yellow Springs

G. H. Hubbell, professor. Collection of 15,000 specimens

Oberlin college, Oberlin

A. A. Wright, professor of geology and natural history. Collection of 7500 specimens

University of Wooster, Wooster

J. Kirkwood, professor of biology and geology. Collection of 3000 specimens

Case school of applied science, Cleveland

F. M. Comstock, professor of geology. Collection of 3000 specimens

Baldwin university, Berea

J. H. Smith, professor of natural science. Collection of 2500 specimens

Urbana university, Urbana

(Vacant.) Collection of 2000 specimens

Hiram college, Hiram

G. H. Colton, professor of natural science. Collection of 1500 specimens

Scio college, Scio

W. G. Compher, professor. Collection of 500 specimens

Otterbein university, Westerville

L. McFadden, professor of chemistry and physics. Collection of 500 specimens

Cincinnati society of natural history, Cincinnati

Joshua Lindahl, museum director. Collections of 2000 specimens include minerals and a very full local collection of fossils, also a general paleontological collection

Heidelberg university, Tiffin

M. E. Kleckner, professor of geology. Collections of fossils and ores of 5000 specimens

OKLAHOMA.

University of Oklahoma, Norman

OREGON.

University of Oregon, Eugene

Thomas Condon, instructor. Collections valued at \$10,000

Oregon state agricultural college, Corvallis

G. W. Shaw, professor. Collection of 2000 specimens

Willamette university, Salem

L. Cochran, professor of natural science. Collection of 1200 specimens

Portland university, Portland

J. J. Rippetoe, professor. Collection of 1000 specimens

PENNSYLVANIA.

Swarthmore college, Swarthmore

Spencer Trotter, professor of biology. Collection of 4000 specimens

Philadelphia Academy of Natural Sciences, Philadelphia

Samuel G. Dixon, executive curator. Collection of about 6000 specimens

Washington and Jefferson college, Washington

Ed. Linton, professor of biology. Collection

University of Pennsylvania, Philadelphia

Edward D. Cope, professor of mineralogy and geology. Collections estimated at 20,000 specimens, including 6000 minerals

Lehigh university, South Bethlehem

Edward H. Williams, jr, professor of mining, engineering and geology. Geological collection of 10,000 specimens and valuable lithological, mineralogical and economic collections

Pennsylvania college, Gettysburg

C. S. Breidenbaugh, curator of museum. Collection of 10,000 specimens

Lafayette college, Easton

T. C. Porter, professor of botany and zoology. Collection of 6000 specimens

Allegheny college, Meadville

Jas. H. Montgomery, professor of physics and chemistry. Collection of 20,000 specimens

Westminster college, New Wilmington

S. Thompson, professor of botany, physics and geology. Collection of 6000 specimens

Dickinson college, Carlisle

W. B. Lindsay, professor of chemistry and geology. Collection of 5000 specimens

Bucknell college, Lewisburg

G. G. Groff, professor of natural history. Collection of 4575 specimens

Haverford college, Haverford

H. S. Pratt, professor. Collection of 3000 specimens

Thiel college, Greenville

S. H. Miller, professor. Collection of 1500 specimens

Muhlenberg college, Allentown

Philip Dowell, professor of natural history. Collection of 1000 specimens

Central Pennsylvania college, New Berlin

W. P. Winter, professor of natural sciences and chemistry. Collection of 3600 specimens

Lebanon Valley college, Annville

J. A. Shott, professor of chemistry, etc. Collection of 600 specimens

Geneva college, Beaver Falls

W. McCracken, professor of sciences. Collection of 600 specimens

Boy's central high school, Philadelphia

O. C. S. Carter, professor. Collection of 540 specimens

Pennsylvania Military college, Chester

B. F. Morley, professor of engineering and chemistry. Collection of 500 specimens

Bryn Mawr college, Bryn Mawr

Miss Florence Bascom, professor of geology. Collections contain 679 fossil specimens, 905 mineral specimens, 86 rock specimens and 500 thin sections supplemented by Miss Bascom's private collections of 1440 rock specimens

Wagner free institute of science, Philadelphia

Thomas L. Montgomery, actuary. Collections rich in American Tertiary invertebrates, 1396 trays and 72 type specimens. Also Eocene and Cretaceous from Alabama and Texas, Paleozoic from Kansas and Europe

Pennsylvania State College, State College

Magnus C. Ihleng, professor of geology. Collections of 7000 geological and 10,000 mineralogical specimens

Philadelphia museums, Philadelphia

W. P. Wilson, director. Extensive geological and mineralogical collections along commercial lines

State geological survey, Philadelphia

J. P. Lesley, State geologist. Extensive state collections, but no estimate given

RHODE ISLAND.**Brown university, Providence**

Alpheus S. Packard, professor of zoology and geology. Collections of minerals 10,066; fossils 6850; rocks 2808; total 19,724 specimens

Roger Williams Park museum, Providence

James M. Southwick, curator. Collection of about 2500 specimens

SOUTH CAROLINA.

Wofford college, Spartanburg

D. A. DuPre, professor of chemistry and physics. Collection of 3000 specimens

Claflin university, Orangeburg

J. C. Hartzell, professor of biology and mineralogy. Collection of 1800 specimens

South Carolina military academy, Charleston

C. L. Reese, professor of chemistry and physics. Collection of 1500 specimens

Furman university, Greenville

W. F. Watson, professor of chemistry. Collection of 500 specimens

SOUTH DAKOTA.

Yankton college, Yankton

A. T. Free, professor. Collection of 6000 specimens

State school of mines, Rapid City

F. C. Smith, professor of geology, mining and metallurgy. Collection of 3027 specimens

University of South Dakota, Vermillion

J. E. Todd, professor of geology. Collection of 3500 specimens

State geological survey

James E. Todd, director, Vermillion. Collections include 500 mineral, 1500 fossil, 1000 rock and 300 economic specimens, and are united with those of the state university.

TENNESSEE.

Vanderbilt university, Nashville

James M. Safford, professor of natural history and geology

Southwestern Presbyterian university, Clarksville

James A. Lyon, professor. Collection of 10,000 specimens

University of Tennessee, Knoxville

C. F. Vanderford, professor. Collection of 3800 specimens

Fisk university, Nashville

F. A. Chase, professor of physical science. Collection of 3000 specimens

Southern normal university, Huntingdon

E. C. McDougle, professor. Collection of 1000 specimens

Carson and Newman college, Mossy Creek

J. C. Welsh, professor. Collection of 1000 specimens

Central Tennessee college, Nashville

William Osburn, professor of natural science. Collection of 1000 specimens

Southwestern Baptist university, Jackson

T. J. Deupur, professor. Collection of 800 specimens

Milligan college, Milligan

Professorship in geology is vacant. Collection of 600 specimens

Maryville college, Maryville

G. S. Fisher, professor. Collection of 500 specimens

Cumberland university, Lebanon

J. I. D. Hinds, dean and professor of chemistry and natural sciences. Collection of 2000 fossils and minerals

TEXAS.

State Geological Survey

E. T. Dumble, state geologist. Extensive collections from the state

University of Texas, Austin

Fred W. Simonds, professor of geology. Collection of 3300 specimens

Howard Payne college, Brownwood

J. L. Kesler, professor. Collection of 650 specimens

UTAH.

University of Utah, Salt Lake City

James E. Talmage, president, and Deseret professor of geology and mineralogy. The museum is that of the Salt Lake literary and scientific association and contains 3000 minerals and rock specimens, 500 vertebrate fossils, 2000 invertebrate fossils, 1000 ethnological specimens. Also 7500 specimens in university museum

VERMONT.

University of Vermont, Burlington

G. H. Perkins, professor of natural history. Collection of 3000 specimens

Middlebury college, Middlebury

Edward A. Burt, professor of natural history. Collection of 4000 specimens

Fairbanks museum of natural science, St. Johnsbury

Martha G. Tyler, curator. Collections include fossils of Vermont and students' collections and about 500 varieties of ores, rocks and minerals

VIRGINIA.

University of Virginia, Charlottesville

W. M. Fontaine, professor of geology and natural history. Collection of 12,500 specimens

Roanoke college, Salem

S. C. Wells, professor. Collection of 12,000 specimens

Virginia military institute, Lexington.

N. B. Tucker, professor of mineralogy and geology. Collection of 3347 specimens

Virginia agricultural and mechanical college, Blacksburg

T. L. Watson, professor. Collection of 2250 specimens

Emory and Henry college, Emory

J. L. Yarman, professor. Collection of 500 specimens

WASHINGTON.

Terry museum, Tacoma

Meriden S. Hill, secretary. Collection of about 500 specimens

Vashon college, Burton

A. C. Jones, professor. Collection of 500 specimens

Tacoma academy of science, Tacoma

Meriden S. Hill, cor. secretary. Geological collection of 500 specimens

State geological survey, Seattle

Henry Landes, state geologist. Economic collection of 1575 specimens, at State university

WEST VIRGINIA.

West Virginia university, Morgantown

S. B. Brown, professor. Collection of 5000 specimens

WISCONSIN.

University of Wisconsin, Madison

C. R. Van Hise, professor. Collection of 15,000 specimens

Northwestern university, Watertown

C. A. Ernst, professor. Collection of 5000 specimens

Milton college, Milton

L. Kumlien, professor. Collection of 5000 specimens

Lawrence university, Appleton

D. Nicholson, professor of natural history. Collection of 3000 specimens

Ripon college, Ripon

C. D. Marsh, professor of biology. Collection of 2800 specimens

Seminary of St. Francis de Sales, St. Francis

L. E. Drexel, professor. Collection of 1500 specimens

Beloit college, Beloit

Geo. L. Collie, curator. Collection of 1200 specimens

Milwaukee public museum, Milwaukee

Dr. Edwin W. Bartlett, president. Collection of 4695 minerals and 11,270 specimens of fossils

Wisconsin academy of sciences, arts and letters, Madison

Albert S. Flint, secretary. Collections are united with those of the University of Wisconsin, but separately labeled. They include the type fossils from the Silurian described in the geology of Wisconsin.

WYOMING.

University of Wyoming, Laramie

W. C. Knight, professor of mining and metallurgy. Collection of 500 specimens

CANADA.

Communicated by Dr. Geo. W. Dawson, assistant director geological survey of Canada.

Provincial museum, Halifax, Nova Scotia

Kings college, Windsor, Nova Scotia

Dalhousie college, Halifax, Nova Scotia

Acadia college, Wolfville, Nova Scotia

Natural history society of New Brunswick, St. John, New Brunswick

Includes the collections of the Mechanics' institute. These are kept separate, and include the collection of Dr. Gesner (rocks, minerals and fossils), made when he was employed on the Geological Survey of New Brunswick. Some of Hartt's fossil insect types are also possessed by the society.

University of New Brunswick, Fredericton, New Brunswick.

Laval university, Quebec, Que.

The nucleus of this collection was the old Cabinet de Mineralogie of the Quebec seminary. The arrangement of the collections was undertaken by Dr. T. Sterry Hunt. Of special interest is a collection of minerals made by the Abbe Haüy for the Quebec seminary. The Mineralogical Cabinet comprises more than 4000 specimens. Good series of Palaeozoic fossils from Bohemia, presented by Joachim Barrande

McGill University, Montreal, Que. (Peter Redpath museum).

Many fine Canadian and foreign minerals and rocks. Collections of Sir J. W. Dawson, largely Carboniferous and Devonian fossil plants. Microsauria and Post-Pliocene mollusks of Canada. Eozoon: Many types of species. The Holmes and Miller collections are incorporated in the general collection of minerals

Natural history society of Montreal, Montreal, Que.

The museum contains the C. U. Shepard Collection of Minerals, presented by Dr. Holmes, and consisting of about 4000 specimens. The mineralogical collections have not been kept up to

date, but contain many good specimens of old finds. General collection of fossils

Montreal college, Montreal, Que.

This institution possesses a collection of minerals made by the Abbe Haüy, similar to that at Laval

Queen's university, Kingston, Ont.

General collection of fossils, including that made by Rev. Andrew Bell

Kingston school of mining and agriculture, Kingston, Ont.

Chiefly economic mineral collection

Museum of Geological Survey of Canada, Ottawa, Ont.

The finest and most complete general collection of Canadian minerals, rocks and fossils. The mineral and lithological collection comprises about 7000 Canadian specimens catalogued and on exhibition. Madoc meteorite. The Paleontological collection comprises over 16,000 Canadian specimens classified and exhibited, representing about 4600 species, of which about 1000 are types described by E. Billings and about 400 types described by J. F. Whiteaves. A number of types of Cretaceous and Tertiary plants described by Sir J. Wm. Dawson. Also types of species established by Prof. E. D. Cope, Dr. S. H. Scudder, Prof. T. Rupert Jones, A. H. Ford, Prof. H. A. Nicholson, E. O. Ulrich, Mr. W. R. Billings and others. Among special suites may be mentioned, fossils characterizing the "Quebec Group," of Logan and Billings. Unique collection of Ordovician Crinoids, etc., from Ottawa and vicinity, Devonian fishes from Bay des Chaleurs, original specimens of *Eozoön Canadense*.

Perth high school, Perth, Ont.

Contains a collection comprising many of Dr. James Wilson's original specimens

University of Toronto, Toronto, Ont.

The Ferrier Cabinet of Minerals, collected by W. F. Ferrier. The largest and most complete general collection in Canada.

School of practical science, Toronto, Ont.

Minerals of economic importance, also fair general collection

Victoria university, Toronto, Ont.

Large meteorite found south of Victoria, N.W.T., 3000 paleontological specimens, 1000 minerals

Hamilton association, Hamilton, Ont.

Includes some interesting local fossils

Ontario agricultural college, Guelph, Ont.

J. Hoyes Panton, professor of geology. Collection of Canadian rocks, minerals and economic minerals

Historical and scientific society of Manitoba, Winnipeg, Man.

Includes a few interesting local fossils

Provincial museum, Victoria, B. C.

Economic minerals, fossils, chiefly Cretaceous

Geological Survey of Newfoundland, St. John's, N. F'd

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REPORT
OF THE
STATE BOTANIST.
1896

REPORT.

To the Honorable the Regents of the University of the State of New York:

GENTLEMEN.—I have the honor of submitting to you the following report:

Since the date of my last report, specimens of plants of the State have been collected by the Botanist in the counties of Albany, Essex, Franklin, Greene, Hamilton, Herkimer, Livingston, Onondaga, Rensselaer, Saratoga, Suffolk, Ulster and Wyoming.

Specimens have been contributed that were collected in the counties of Albany, Delaware, Dutchess, Essex, Madison, Monroe, Onondaga, Queens, Rensselaer, Saratoga, St. Lawrence, Warren, Washington and Westchester.

The whole number of species represented by specimens added to the Herbarium is 402, of which the collections of the Botanist represent 367, the contributed specimens 35.

The number of species not before represented in the Herbarium, of which specimens have been added, is 99. Of these, 81 belong to the collections of the Botanist and 18 are represented by the contributed specimens.

Of the species new to the Herbarium, 33 are considered new to science and are described in this report for the first time. Specimens of 27 of these are among the collections of the Botanist, the remaining 6 are represented by contributed specimens.

A list of the names of the species of which specimens have been added to the Herbarium is marked A.

Specimens of plants have been contributed by 43 contributors. Many of their contributions represent species not yet found within the limits of our State. Some of these, though sent for identification merely, have been found to be new or undescribed species and will be carefully preserved as the types of the species represented by them.

A list of the contributors and of their respective contributions is marked B.

A record of species new to our flora, giving locality, time of collecting and other matters of interest concerning them; also in case of new species giving descriptions of them, has been made. A few plants previously reported and regarded as mere varieties of other reported species have now been either raised or restored to the rank of distinct species and included in this record. It is marked C.

According to previous custom, a record of observations upon certain species already reported has been made. This will be found to contain various matters of interest concerning those plants, such as new stations for rare species, an extension of previously known geographical range, unusual habitats, noticeable variations and descriptions of new varieties. It is marked D.

In some of the preceding reports a collation in systematic order has been made of all the known New York species belonging to some particular genus, and full descriptions of the species, generally supplemented by additional remarks on their peculiarities, relations and distinctive features, have been given. This work was begun with the purpose of gradually bringing together material for a descriptive manual of all our agarics. These little monographs have been well received and have been a source of much aid to students of our American mycology. They have been so highly appreciated in some instances that special requests have been received for the reports con-

taining them. Another step has therefore been taken in the present report in pursuance of this plan by the collation of the descriptions of our species of the genus *Flammula*. This part of the report is marked E.

There is a constantly and rapidly increasing demand for such a descriptive manual as these and the remaining contemplated generic monographs would make if brought together in one volume. Such a volume, especially if each genus could be illustrated by a colored figure of some prominent or type species, would add greatly to the general interest in this branch of mycology and would give to its study a strong forward impulse. The demand for this kind of literature seems to increase more rapidly than its supply. Earnest wishes that such a work might soon be available have repeatedly been made known to me, and I have sometimes been surprised at the indications of a great and widespread interest in this lowly and apparently unattractive class of plants. The fact that these plants exhibit an intelligent design in their structure and are just as capable of systematic arrangement and classification as the higher orders of plants doubtless has much to do in arousing an interest in them, but probably the great promise they give of affording a useful reward for their study in the form of a desirable article of food has also something to do with it. The numerous and earnest applications in advance of its publication for copies of the forthcoming Forty-eighth Report, which contains an illustrated and descriptive account of our edible and poisonous fungi, are indications of this.

The past season has been unusually productive of certain crops. Wild plants have in some instances vied with cultivated ones in showing what large crops of fruit they could produce. The choke cherry shrubs of the Adirondack region have been as heavily loaded in proportion to their size as the apple trees of our orchards. Their

branches have been weighed down by their loads of fruit. And this great and unusual productiveness has been seen in some of our agarics. The common mushroom, *Agaricus campester*, was never before known by me to be more plentiful in our State. It began to make its appearance earlier than usual, generous crops being found early in August, and it continued to appear in great abundance until cold weather stopped its growth. Even moderate frost does not stop its development, for sometimes, as during the autumn of 1895, and also of 1896, plentiful gatherings of it were made after the ground had been white with frost. The markets of Albany have recently been supplied with an unusual abundance of them. They have been exposed for sale by dealers on whose stands they have rarely if ever before been seen. They have been peddled about the streets and offered for sale at the low price of fifteen cents a quart. Farmers in the vicinity of our large cities have found in them a volunteer crop of their pastures that has added no insignificant amount to their incomes. A correspondent writing from Utica says that the crop of the common mushroom in Oneida county was of extraordinary abundance and that the mushrooms were sold in Utica by farmers and peddlers at twenty cents a quart and that he never before knew them to be plentiful enough to be sold at retail in this way.

Another correspondent, who resides in an adjoining State, and who is an enthusiastic mycophagist, writes that he has at last had a sufficiency of mushrooms, and that they have been offered for sale at his door in such quantity that he has been obliged to decline to purchase them even at the extremely low price of five cents a quart. A newspaper report affirms that in a village in the western part of the State mushrooms were sold in lots of ten quarts for twenty-five cents, a rate of two and a half cents a quart. This is a good illustration of the effect of a bountiful supply upon the price of an article.

In many places the smooth mushroom, *Lepiota naucinoides*, has been quite as plentiful as the common mushroom. In some respects this is superior to the common mushroom. It is less liable to the attack of insects, it will keep longer in good condition and it presents a more attractive appearance when cooked, as its gills do not turn black with age or under the influence of heat. Its flavor is thought by some to be inferior to that of the common mushroom, but others affirm that even in this respect it is more delicate and desirable. It has a wider range of habitat, growing in lawns, pastures, grassy places by roadsides, in the plowed land of potato and corn fields and even in thin woods. From its clean white color, the people of some localities have given it the local name of "white mushroom." It has sometimes been mistaken for the chalky mushroom, *Agaricus cretaceus*. But if we may trust the writings of the best European authors in this matter, the chalky mushroom has brown spores, but the smooth mushroom has white spores, although agreeing closely with the chalky mushroom in many of its characters. This fungus was so abundant about Albany that one lover of mushrooms brought in about a peck of them one day, and affirmed that where he picked them he could easily have filled a barrel with those left behind. I have recently received more letters of inquiry concerning the name, character and edibility of this mushroom than of any other. Its neat appearance and great abundance have attracted attention and suggested the possibility of its edibility and awakened in its observers a desire for information concerning it. It therefore seems proper to attribute some of the present interest in the subject of mushrooms to the abundant crop of certain species that the favorable conditions of the season have produced.

In the Forty-first Report an index of the genera and species mentioned in reports twenty-two to thirty-eight inclusive, was published. A similar index has been prepared for the ten succeeding reports, thirty-nine to forty-eight, and is herein included. It is marked F.

In the prosecution of my investigations of the edible qualities of our more promising species of mushrooms, a considerable number have been tried and of these, eight species additional to those already reported seem to me worthy of being placed in the list of edible ones. But the room now occupied in part by me is poorly lighted and not a very suitable place in which to do work requiring a good light. It has, therefore, seemed to me best to omit for the present the attempt to make proper illustrations of these and to report on them, hoping that soon better facilities for such work will be available.

By reason of the requirements of the State Engineer, the room previously occupied in the State Hall as an office for the Botanist and a place for the State Herbarium was vacated in January and the Herbarium cases, containing the mounted specimens and a part of the duplicates, were transferred to the fourth floor of the Capitol and placed in one of the corridors near the office of the State Entomologist.

The remaining duplicates, the specimens unsuitable for mounting, that had been arranged in trays and kept in table cases, the greater part of the specimens of fungi belonging to the exhibit of our State at the World's Columbian Exposition and the models of fungi donated to the State Herbarium by the Agricultural Department at Washington, were packed in boxes and are now in storage on the fifth floor of the Capitol.

Desk room and space for a table was given me for temporary occupancy in one of the rooms of the State Entomologist. By this arrangement my work is necessarily hindered and the proper care of

the stored specimens is practically placed beyond my control. They are not accessible for inspection, reference, study or comparison, and if kept long in that condition they are liable to suffer injury and possibly irreparable loss.

The specimens in the Herbarium cases are kept under lock and key, but the light glass-paneled doors of the cases do not furnish all the safeguard to the contents that is desirable. It is, therefore, greatly to be hoped that this state of things will not continue longer than is absolutely necessary, and that soon suitable safe and adequate accommodations will be assigned to the Herbarium and the necessary office and working room to the Botanist.

Respectfully submitted,

CHAS. H. PECK.

ALBANY, *November 30, 1896.*

(A.)

PLANTS ADDED TO THE HERBARIUM.

New to the Herbarium.

Geranium molle L.
 G. dissectum L.
Prunus Mahaleb L.
 P. nigra Ait.
Amelanchier spicata DC.
 A. oligocarpa Ram.
Pimpinella Saxifraga L.
Sanicula gregaria Bick.
Coreopsis tinctoria Nutt.
Senecio obovatus Muhl.
 S. Balsamitæ Muhl.
Azalea lutea L.
Lysimachia vulgaris L.
Symphytum asperrimum Sims.
Monarda punctata L.
Fissidens incurvus Schwagr.
Diplophyllum taxifolium Dum.
Jungermannia autumnalis DC.
Amanita magnivelaris Ph.
Amanitopsis pusilla Ph.
Lepiota subprocera Saut.
 L. Miamiensis Morg.
 L. rugoso-reticulata Lorin.
Tricholoma ionides Bull.
Clitocybe virens Scop.
Collybia nigrodisca Ph.
 C. uniformis Ph.
Pleurotus mastrucatus Fr.
Lactarius seriffius Fr.
Russula anomala Ph.
 R. albella Ph.
 R. cyanoxantha Fr.
 R. ochrophylla Ph.
 R. pusilla Ph.
Marasmius impudicus Fr.
Entoloma grande Ph.
Nolanea picea Kalchb.
Pholiota rugosa Ph.
 P. confragosa Fr.
Flammula magna Ph.
 F. rigida Ph.

Inocybe unicolor Ph.
Cortinarius nitidus Fr.
Paxillus Curtisii Berk.
Stropharia siccipes Karst.
Hypholoma capnoides Fr.
Psathyra umbonata Ph.
Psathyrella hirta Ph.
Coprinus quadrifidus Ph.
Boletus auripes Ph.
 B. firmus Frost.
 B. fumosipes Ph.
 B. illudens Ph.
 B. rubropunctus Ph.
Polyporus umbellatus Fr.
Hydnum fennicum Karst.
 H. spongiosipes Ph.
 H. vellereum Ph.
 H. albonigrum Ph.
 H. mirabile Fr.
 H. separans Ph.
 H. serratum Ph.
Hydnochaete setigera Ph.
Radulum Pini-Canadense Schw.
Odontia ramosissima Ph.
Coniophora subochracea Ph.
Exobasidium Peckii Halst.
Phyllosticta Apocyni Trel.
 P. limitata Ph.
Dendrophoma crassicolis S. & S.
Diplodina quercina Ph.
Pestalozzia breviseta Sacc.
Puccinia Prenanthis Fekl.
Æcidium Rhamni Pers.
 Æ. Senecionis Desm.
Coleosporium Campanulæ Wint.
Septoria Lobeliæ-syphiliticæ Henn.
Clavaria platyclada Ph.
Oidium erysiphoides Fr.
Ectocephalum intermixtum Ph.
Sporotrichum entomophilum Ph.
Ramularia occidentalis E. & K.

Ramularia cylindriopsis *Pk.*
Verticillium enecans *Speg.*
Cladosporium caricolum *Cd.*
Heterosporium gracile *Sacc.*
Phragmotrichum Chailetii *Kse.*
Macrosporium Iridis *C. & E.*
M. Amaranthi *Pk.*
Septonema toruloideum *C. & E.*
Entyloma Veronicæ *Lager.*

Peronospora calotheca *DeBy.*
Exoascus Cerasi *Sadeb.*
Peziza subumbrina *Boud.*
Spathularia rugosa *Pk.*
Cenangium Abietis *Rehm.*
Xylaria castorea *Berk.*
Diaporthe decipiens *Sacc.*
Phyllachora Junci *Fckl.*

Not New to the Herbarium.

Hepatica triloba *Chaix.*
Aquilegia vulgaris *L.*
Nymphaea reniformis *DC.*
N. odorata *Ait.*
Corydalis glauca *Pursh.*
Cardamine hirsuta *L.*
C. pratensis *L.*
Nasturtium sylvestre *R. Br.*
Alliaria Alliaria *Britton.*
Lepidium campestre *Br.*
Barbarea vulgaris *R. Br.*
Helianthemum Canadense *Mx.*
Lechea minor *L.*
Arenaria Groenlandica *Spreng.*
Silene antirrhina *L.*
Anychia dichotoma *Mx.*
Claytonia Virginica *L.*
C. Caroliniana *Mx.*
Tilia pubescens *Ait.*
T. heterophylla *Vent.*
Floerkea proserpinacoides *Willd.*
Xanthoxylum Americanum *Mill.*
Rhamnus alnifolia *L'Her.*
Euonymus atropurpureus *Jacq.*
Rhus copallina *L.*
Polygala verticillata *L.*
Melilotus officinalis *L.*
Robinia viscosa *Vent.*
Desmodium nudiflorum *DC.*
D. Dillenii *Darl.*
Gymnocladus Canadensis *Lam.*
Prunus Americana *Marsh.*
P. serotina *Ehrh.*
Pyrus coronaria *L.*
Rubus triflorus *Rich.*
Fragaria Virginiana *Mill.*

Crataegus coccinea *L.*
C. punctata *Jacq.*
C. Oxyacantha *L.*
Ribes rubrum *L.*
Cicuta bulbifera *L.*
Zizia cordata *DC.*
Sanicula Canadensis *L.*
S. Marylandica *L.*
Cornus paniculata *L'Her.*
Viburnum Opulus *L.*
Symphoricarpos vulgaris *Mx.*
Galium verum *L.*
G. Mollugo *L.*
G. pilosum *Ait.*
G. trifidum *L.*
Valeriana sylvatica *Banks.*
Erigeron Philadelphicus *L.*
Solidago puberula *Nutt.*
Aster sagittifolius *Willd.*
A. corymbosus *Ait.*
A. puniceus *L.*
A. undulatus *L.*
A. laevis *L.*
A. diffusus *Ait.*
Cichorium Intybus *L.*
Rudbeckia hirta *L.*
Artemisia caudata *Mx.*
Tragopogon porrifolius *L.*
Hieracium scabrum *Mx.*
H. aurantiacum *L.*
Lactuca sativa *L.*
Vaccinium vacillans *Soland.*
Pyrola rotundifolia *L.*
P. chlorantha *Sw.*
P. elliptica *Nutt.*
P. uliginosa *T. & G.*

- Pyrola secunda L.*
Chimaphila maculata Pursh.
Monotropa Hypopitys L.
Ilex monticola Gr.
Lysimachia thyrsiflora L.
Symphytum officinale L.
Fraxinus viridis Mx.
F. Americana L.
Asclepias tuberosa L.
A. incarnata L.
A. quadrifolia L.
Phlox subulata L.
Gentiana Andrewsii Griseb.
Solanum Dulcamara L.
Linaria vulgaris Mill.
Veronica Americana Schw.
Gerardia flava L.
Plantago major L.
Amaranthus hypochondriacus L.
Atriplex patulum L.
Phytolacca decandra L.
Rumex crispus L.
R. Britannica L.
Fagopyrum esculentum Manch.
Polygonum incarnatum Ell.
P. Pennsylvanicum L.
P. Hydropiper L.
P. acre H. B. K.
Sassafras officinalis Nees.
Arceuthobium pusillum Pk.
Ulmus fulva Mx.
Morus rubra L.
Carya tomentosa Nutt.
C. porcina Nutt.
C. amara Nutt.
Betula populifolia Ait.
Quercus alba L.
Q. macrocarpa Mx.
Q. bicolor Willd.
Q. tinctoria Bartr.
Salix candida Willd.
Thuja occidentalis L.
Corallorhiza innata R. Br.
C. multiflora Nutt.
Epipactis Helleborine Crantz.
Spiranthes latifolia Torr.
Habenaria hyperborea R. Br.
Habenaria psycodes Gr.
Cypripedium arietinum R. Br.
C. spectabile Sw.
Smilacina trifolia Desf.
Trillium erectum L.
Calla palustris L.
Lemna trisulca L.
Triglochin maritima L.
Cyperus esculentus L.
Eriophorum lineatum B. & H.
E. alpinum L.
Carex lupulina Muhl.
C. livida Willd.
C. lurida Wuhl.
C. Schweinitzii Dew.
C. comosa Boott.
C. filiformis L.
C. stricta Lam.
C. xanthosperma Wright.
C. Magellanica Lam.
C. limosa L.
C. virescens Muhl.
C. castanea Wuhl.
C. laxiflora Lam.
C. Albursina Sheld.
C. styloflexa Buckley.
C. aurea Nutt.
C. varia Muhl.
C. chondorhiza Ehrh.
C. stipata Muhl.
C. teretiuscula Good.
C. straminea Willd.
C. foenea Willd.
C. vulpinoidea Mx.
Setaria glauca Bv.
S. viridis Bv.
Panicum macrocarpon LeConte.
Andropogon furcatus Muhl.
Glyceria nervata Trin.
Agropyron repens Bv.
Bromus tectorum L.
Festuca duriuscula L.
Elymus Virginicus L.
E. striatus Willd.
Asprella Hystrix Willd.
Woodwardia Virginica Sm.
Aspidium Boottii Tuckerm.

Aspidium cristatum Sw.
Botrychium ternatum Sw.
 B. *Virginianum Sw.*
Isoetes echinospora (Durieu).
Amanita caesarea Scop.
 A. *verna Bull.*
 A. *Mappa Fr.*
 A. *muscaria L.*
 A. *Frostiana Pk.*
 A. *rubescens Fr.*
 A. *solitaria Bull.*
Amanitopsis vaginata Rose.
 A. *volvata Sacc.*
 A. *farinosa (Schw.).*
Tricholoma tricolor Pk.
 T. *fumidellum Pk.*
Clitocybe clavipes Pers.
 C. *illudens Schw.*
 C. *truncicola Pk.*
Omphalia Swartzii Fr.
Collybia strictipes Pk.
 C. *conigena Pers.*
Pleurotus ostreatus Fr.
 P. *lignatilis Fr.*
Hygrophorus parvulus Pk.
 H. *miniatus Fr.*
 H. *virginicus Fr.*
Lactarius volemus Fr.
 L. *subpurpureus Pk.*
 L. *trivialis Fr.*
 L. *insulsus Fr.*
 L. *subdulcis Fr.*
 L. *vellereus Fr.*
 L. *deceptivus Pk.*
Russula nigricans Fr.
 R. *lepida Fr.*
 R. *Mariæ Pk.*
 R. *virescens Fr.*
 R. *flavida Frost.*
 R. *variata Banning.*
 R. *crustosa Pk.*
 R. *decolorans Fr.*
 R. *alutacea Fr.*
Cantharellus cinereus Fr.
 C. *aurantiacus Fr.*
 C. *infundibuliformis Fr.*
Marasmius oreades Fr.

Marasmius præacutus Ellis.
Lenzites betulina Fr.
Pluteus umbrosus Pers.
 P. *longistriatus Pk.*
Entoloma rhodopolium Fr.
Clitopilus Prunulus Scop.
Leptonia formosa Fr.
Pholiota angustipes Pk.
Inocybe infelix Pk.
 I. *rimosa Bull.*
 I. *geophylla Sow.*
Flammula spumosa Fr.
 F. *flavida Pers.*
Naucoria semiorbicularis Bull.
Galera lateritia Fr.
Cortinarius collinitus Fr.
 C. *corrugatus Pk.*
 C. *violaceus Fr.*
 C. *cinnamomeus Fr.*
 C. *distans Pk.*
Paxillus involutus Batsch.
 P. *atrotomentosus Fr.*
 P. *panuoides Fr.*
Agaricus campester L.
 A. *arvensis Schaff.*
 A. *silvicola Vitt.*
Hypholoma fasciculare Huds.
Psathyrella disseminata Pers.
Poria floccosa Fr.
Strobilomyces strobilaceus Berk.
Boletus bicolor Pk.
 B. *pallidus Frost.*
 B. *subtomentosus L.*
 B. *griseus Frost.*
 B. *variipes Pk.*
 B. *eximius Pk.*
 B. *affinis Pk.*
 B. *vermiculosus Pk.*
 B. *Frostii Russell.*
 B. *scaber Fr.*
 B. *gracilis Pk.*
 B. *indecisus Pk.*
 B. *felleus Bull.*
 B. *castaneus Bull.*
 B. *cyanescens Bull.*
Hydnum imbricatum L.
 H. *repandum L.*

Hydnum fruscens Pers.
H. albidum Pk.
H. aurantiacum A. & S.
H. scrobiculatum Fr.
H. zonatum Batsch.
H. Caput-ursi Fr.
H. strigosum Sw.
H. ochraceum Pers.
H. subfuscum Pk.
H. rimulosum Pk.
Craterellus Cantharellus Schw.
C. cornucopioides Pers.
Telephora laciniata Pers.
Stereum spadiceum Fr.
S. sericeum Schw.
S. versiforme B. & C.
S. albobadium Schw.
Anthurus borealis Burt.
Fuligo varians Rost.
Amaurochæte atra (A. & S.)
Hemiarcyria rubiformis R.
Sphærobolus stellatus Tode.

Phyllosticta Podophylli Wint.
Glœosporium Apocyni Pk.
Puccinia Taraxaci Plow.
P. Mariæ-Wilsoni Clint.
Ustilago Junci Schw.
U. Cesatii Fisch.
Uredo Agrimoniz Schræf.
Cæoma nitidum Schw.
Æcidium Iridis Ger.
Oidium destruens Pk.
Rhopalomyces Cucurbitarum B. & C.
Verticillium Lactarii Pk.
Botrytis Streptothrix Sacc.
Rhinotrichum ramosissimum B. & C.
Zygodesmus pannosus B. & C.
Z. olivascens B. & C.
Spathularia flava Pers.
Pezicula carpinea Tul.
Patellaria fusispora C. & P.
Daldinea concentrica C. & D.
D. vernicosa C. & D.

(B.)

CONTRIBUTORS AND THEIR CONTRIBUTIONS.

Mrs. E. C. Anthony, Gouverneur, N. Y.

Viola cucullata Ait.
Aralia nudicaulis L.
Solidago puberula Nutt.
Lysimachia stricta Ait.
Cypripedium acaule L.
Spiranthes cernua L.

Spiranthes Romanzoffiana Cham.
Fissidens incurvus Schwagr.
Amanitopsis pusilla Pk.
Tricholoma ionides Bull.
Polyporus umbellatus Fr.

Mrs. L. L. Goodrich, Syracuse, N. Y.

Pyrus coronaria L.
Galium verum L.

Epipactis Helleborine Crants.

Mrs. E. G. Britton, New York, N. Y.

Frullania Eboracensis Lehm.
Lejeunia serpyllifolia Lib.
Blepharostoma trichophyllum Dum.
Cephalozia bicuspidata Dum.
Scapania nemorosa Dum.
Diplophyllum taxifolium Dum.
Chiloscyphus polyanthos Cd.

Myla Taylori Gray.
Jungermannia attenuata Lind.
J. autumnalis DC.
Marsupella emarginata Dum.
Plagiochila porelloides Lind.
Aneura bifrons Lind.
Tetraplodon mnioides L. f.

Mrs. E. Watrous, Hague, N. Y.

Liparis Loeselii Rich.

Mrs. H. C. Davis, Falmouth, Me.

Clavaria platyclada Pk.

Miss M. L. Overacker, Syracuse, N. Y.

Buda marina Dum.

| *Poterium Sanguisorba* L.

Mrs. J. A. Lintner, Albany, N. Y.

A collection of about 70 species of dried plants.

Mrs. M. Fuller, Washington, D. C.

Armillaria robusta A. & S.

| *Hydnum fuligineo-album* Schm.

Arthur K. Harrison, Lebanon Springs, N. Y.

Viola rostrata Pursh.

Hypericum nudicaule Walt.

Arenaria serpyllifolia L.

Vicia Cracca L.

Cratægus coccinea L.

Cornus paniculata L'Her.

Houstonia purpurea L.

Ambrosia artemisiæfolia L.

Antennaria plantaginifolia Hook.

Epigæa repens L.

Cuscuta Gronovii Willd.

Utricularia cornuta Mx.

Rumex Acetosella L.

Juncus articulatus L.

Cyperus diandrus Torr.

C. *filiculmis* Vahl.

Eleocharis acicularis R. Br.

Bromus tectorum L.

Onoclea sensibilis L.

Botrychium Virginianum Sw.

Lycopodium clavatum L.

Geo. R. Howell, Albany, N. Y.

Artemisia caudata Mx.

Augustus Lathrop, Menands, N. Y.

Rudbeckia hirta L.

F. C. Stewart, Jamaica, N. Y.

Exobasidium Peckii Halst.

Ramularia cylindriopsis Pk.

Phyllosticta limitata Pk.

Amaurochæte atra (A. & S.).

Oidium destruens Pk.

Diplodina quercina Pk.

Exoascus Cerasi Fckl.

M. S. Baxter, Rochester, N. Y.

Aspidium Boottii Tuckerm.

J. H. Barnhart, Tarrytown, N. Y.

Alliaria Alliaria Britt.

Kneiffia fruticosa (L.).

Azalea lutea L.

L. M. Underwood, New York, N. Y.

Anthoceros lævis <i>L.</i>	Porella pinnata <i>L.</i>
A. Hallii <i>Aust.</i>	Frullania Selwyniana <i>Pers.</i>
A. fusiformis <i>Aust.</i>	Lejeunia Macounii <i>Spruce</i>
A. Carolinianus <i>Mx.</i>	L. serpyllifolia <i>Lib.</i>
Riccia nigrella <i>DC.</i>	Kantia Sprengelii (<i>Mart.</i>)
Aytonia erythrosperma <i>Und.</i>	Blepharostoma nematodes (<i>Aust.</i>)
Cyathophora quadrata <i>Trev.</i>	Lentinus Underwoodii <i>Pk.</i>
Lepidozia sphagnicola <i>Evans.</i>	L. ventricosus <i>Pk.</i>
Nardia Macounii <i>Und.</i>	Pholiota sabulosa <i>Pk.</i>
Chiloscyphus polyanthos <i>Cd.</i>	Flammula Underwoodii <i>Pk.</i>
Plagiochila Virginica <i>Evans.</i>	Boletus tabacinus <i>Pk.</i>
Jungermannia Novæ-Cæsareæ <i>Evans.</i>	Puccinia argentata <i>Wint.</i>
Cephalozia fluitans <i>Spruce.</i>	Coleosporium Campanulæ <i>Wint.</i>
C. Turneri <i>Lindb.</i>	

G. F. Atkinson, Ithaca, N. Y.

Sphagnum teres <i>Angst.</i>	Sphagnum acutifolium <i>Ehrh.</i>
S. intermedium <i>Hoffm.</i>	S. squarrosum <i>Pers.</i>
S. Girgensohnii <i>Russ.</i>	S. Wulfianum <i>Girg.</i>

M. B. Fernald, Cambridge, Mass.

Aster Herveyi *Gr.*

W. D. Jackson, Bridgewater, Mass.

Inocybe radiata *Pk.*

F. B. Southwick, Brooklyn, N. Y.

Anthurus borealis *Burt.*

A. C. Waghorne, Bay of Islands, Nfld.

Amphisphæria inæqualis <i>E. & E.</i>	Sclerotinia infundibuliformis <i>Pk.</i>
Panus betulinus <i>Pk.</i>	

J. B. Fuller, Rochester, N. Y.

Lepidium campestre <i>Br.</i>	Symphytum asperrimum <i>Sims.</i>
Nasturtium sylvestre <i>R. Br.</i>	Rumex crispus <i>L.</i>
Geranium molle <i>L.</i>	Oenothera pumila <i>L.</i>
Phlox subulata <i>L.</i>	Setaria viridis <i>Bv.</i>
Arceuthobium pusillum <i>Pk.</i>	Bromus tectorum <i>L.</i>
Solanum Dulcamara <i>L.</i>	

Stewart H. Burnham, Vaughns, N. Y.

Nymphæa reniformis <i>DC.</i>	Pimpinella Saxifraga <i>L.</i>
Solidago puberula <i>Nutt.</i>	Aspidium Boottii <i>Tuckerm.</i>
Aster sagittifolius <i>Willd.</i>	Botrychium ternatum <i>Sw.</i>

F. L. Harvey, Orono, Me.

Poria violacea <i>Fr.</i>	Embolus ochreateus <i>Sacc.</i>
Hypomyces violaceus <i>Tul.</i>	Heydenia fungicola <i>Pk.</i>
Peziza odorata <i>Pk.</i>	

E. Bartholomew, Rockport, Kan.

<i>Lepiota Morgani</i> <i>Pk.</i>	<i>Pistillaria Bartholomæi</i> <i>E. & E.</i>
<i>L. mutata</i> <i>Pk.</i>	<i>Hypoxydon Caries</i> (<i>Schw.</i>).
<i>Psathyrella debilis</i> <i>Pk.</i>	<i>Puccinia tecta</i> <i>E. & B.</i>
<i>P. gracillima</i> <i>Pk.</i>	<i>P. Triodizæ</i> <i>E. & B.</i>
<i>Polyporus Bartholomæi</i> <i>Pk.</i>	<i>P. Kansensis</i> <i>E. & B.</i>
<i>Tylostoma punctatum</i> <i>Pk.</i>	<i>P. clavispora</i> <i>E. & B.</i>
<i>T. obesum</i> <i>C. & E.</i>	<i>P. jubata</i> <i>E. & B.</i>
<i>Lycoperdon lilaceum</i> <i>B. & M.</i>	<i>P. vexans</i> <i>Arth.</i>
<i>Scleroderma Corium</i> <i>Grav.</i>	<i>P. Bartholomæi</i> <i>Diet.</i>
<i>Stereum albobadium</i> <i>Schw.</i>	<i>P. Xanthifoliæ</i> <i>E. & E.</i>
<i>Corticium argentatum</i> <i>E. & E.</i>	<i>Cryptophallus albiceps</i> <i>Pk.</i>

A. J. McClatchie, Pasadena, Cal.

<i>Lentinus magnus</i> <i>Pk.</i>	<i>Hypholoma atrifolium</i> <i>Pk.</i>
<i>Tubaria tenuis</i> <i>Pk.</i>	<i>Montagnites Candollei</i> <i>Fr.</i>

H. W. Barratt, Poughkeepsie, N. Y.

Tricholoma terreum *Schæff.* var. *fragrans* *Pk.*

E. C. Howe, Troy, N. Y.

<i>Koeleria cristata</i> <i>Pers.</i>	<i>Polyporus conchifer</i> <i>Schw.</i>
<i>Agropyron violaceum</i> <i>Lange.</i>	

F. C. Yeomans, Camas, Wash.

<i>Clitocybe subsocialis</i> <i>Pk.</i>	<i>Galera semilanceata</i> <i>Pk.</i>
<i>Omphalia luteola</i> <i>Pk.</i>	<i>Boletinus appendiculatus</i> <i>Pk.</i>

C. G. Lloyd, Cincinnati, Ohio.

<i>Dædalea Kansensis</i> <i>Ellis.</i>	<i>Marasmius gregarius</i> <i>Pk.</i>
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H. Webster, East Milton, Mass.

Lactarius luteolus *Pk.*

F. G. Howland, Saratoga Springs, N. Y.

Clitocybe dealbata *Sow.*

J. Dearness, London, Canada.

Melogramma horridum *E. & E.*

J. A. Lintner, Albany, N. Y.

Sporotrichum entomophilum *Pk.*

B. Jones, New York, N. Y.

Flammula magna *Pk.*

W. Herbst, Trexlertown, Penn.

Russula subdepallens *Pk.*

C. McIlvaine, Haddonfield, N. J.

<i>Cortinarius intrusus</i> <i>Pk.</i>	<i>Flammula edulis</i> <i>Pk.</i>
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G. E. Francis, Worcester, Mass.

Tricholoma acre *Pk.**Tricholoma pallidum* *Pk.*T. *polyphyllum* *DC.*

R. K. Macadam, Boston, Mass.

Cortinarius intrusus *Pk.*

Calvin Shaffer, Albany, N. Y.

An ear of corn with all its kernels smutted.

R. F. Dearborn, Lynn, Mass.

Lepiota rhacodes *Vitt.*

W. Frothingham, Albany, N. Y.

Agaricus campester *L.*

W. Hailes, Albany, N. Y.

Agaricus campester *L.**Lepiota naucinoides* *Pk.*A. *Rodmani* *Pk.*

H. C. Beardslee, Cleveland, Ohio.

Boletus rubropunctus *Pk.*

(C.)

SPECIES OF PLANTS NOT BEFORE REPORTED.

Geranium molle* *L.

Grassy places. Rochester. June. Collected by *Mary E. Macaulley*; communicated by *J. B. Fuller*.

This plant has been introduced into this country from Europe and is occasionally spontaneous.

Geranium dissectum* *L.

Waste places. Vaughns, Washington county. June. *S. H. Burnham*. This also is an introduced species which is sometimes spontaneous. It resembles our indigenous Carolina crane's bill, *G. Carolinianum*, from which it may be separated by its shorter, nearly globular, finely-pitted seeds. It is a rare species.

Prunus Mahaleb* *L.

Rocky bank of the Hudson river above Lansingburg, Rensselaer county. May and June.

This small cherry as well as our other introduced and cultivated species is sometimes spontaneous.

***Prunus nigra* Ait.**

Meadowdale, Helderberg mountains, and various places in Essex county. May.

This wild plum has commonly been considered a mere form or variety of our common wild red plum, *Prunus Americana*. But it seems to me that greater accuracy will be attained and the purposes of science will be better subserved if it is kept separate. Both species occur in the vicinity of Albany and present noticeable differences. In *P. nigra* the flowers are rather larger and sometimes, at least, if not always, the petals assume a pink or rosy hue with advancing age. The fruit is larger and its stone is larger and more compressed.

***Amelanchier oligocarpa* Ram.**

Adirondack mountains. Why this plant was ever reduced to the rank of a mere variety of *A. Canadensis* is more than I can clearly understand. It differs from that species in its leaves, flowers and fruit, and so far as my observation goes, in the size it attains, and the habitat it manifestly prefers. Its leaves are thinner and smooth even when young, they are pointed at the base, tapering into a petiole but two to three lines long, its flowers are smaller and fewer in a cluster, its fruit is oval rather than globose and the plant appears to delight in the cool shade of mountain forests and in elevated situations. It flowers in June and ripens its fruit in July and August.

***Amelanchier spicata* DC.**

Sandy soil. Karner, Albany county. Thin shaly soil covering rocks. Near Lansingburg, Rensselaer county. Flowering in May, in fruit in June and July.

This plant, as it occurs with us, is well marked and quite distinct in the character of its leaves. These are very unlike those of the preceding species in character and texture. They are thick and firm, densely woolly on the lower surface when young, orbicular or oval and very obtuse at both ends. They are more coarsely serrate than in our other species, and the serratures are mostly limited to the upper half of the leaf. The petiole varies in length from three to six lines. The flowers are small and commonly numerous, giving a

spike-like appearance to the racemes. The plants are small, those of the Lansingburg station scarcely exceeding a foot in height, yet they were found flowering and fruiting.

Pimpinella Saxifraga L.

In a meadow near Vaughns. *Burnham*. This is an introduced species rarely found growing spontaneously.

Sanicula gregaria Bicknell.

Near Albany. June. This species has recently been separated from *S. Marylandica*, with which it has been confused. The fertile flowers have long styles as in that species, but it is more gregarious in its mode of growth, its petals are yellowish, its stem naked below the branches or at most bearing but one leaf, and its rather numerous radical leaves have only five leaflets each, the basal leaflets not being deeply cleft as in both *S. Marylandica* and *S. Canadensis*.

Coreopsis tinctoria Nutt.

In a meadow between Ballston and Round Lake, Saratoga county. August.

This plant is indigenous west of the Mississippi river. It is often cultivated as an ornamental plant and it sometimes escapes from cultivation and becomes sparingly spontaneous.

Azalea lutea L.

Tarrytown. May. *J. Hendley Barnhart*. Pennsylvania is given in the Manual as the northern limit of the range of this beautiful flame-colored azalea (*Rhododendron calendulaceum* Torr. in the Manual), but its recent discovery in Westchester county extends this limit northward and adds a pretty flowering shrub to our flora.

Senecio obovatus Muhl.

Rather moist soil in thin woods. Southfields, Orange county, and New Baltimore, Greene county. June.

This and the next following species were reported by Dr. Torrey as varieties of *Senecio aureus*. But the present tendency of our leading

botanists is to recognize their specific rank. They are, therefore, now reported as valid species. The radical or basal leaves furnish the most available characters for the separation of the four species formerly lumped together under one name. The distinguishing features may be tabulated as follows:

Radical leaves cordate.....	<i>S. aureus.</i>
Radical leaves not cordate.....	<i>I</i>
1 Radical leaves round, obovate or spatulate, tapering below into a somewhat flattened or margined and commonly glabrous petiole.....	<i>S. obovatus.</i>
1 Radical leaves oblong or oblong-lanceolate, crenately toothed, tapering below into a slender more or less hairy or tomentose petiole.....	<i>S. Balsamitæ.</i>
1. Radical leaves oblong or lanceolate, sharply serrate, almost truncate at the base or abruptly narrowed into the glabrous petiole.....	<i>S. Robbinsii.</i>

Senecio Balsamitæ Muhl.

Rocky places or thin soil covering rocks. Brownsville, Jefferson county, and Whitehall, Washington county. June.

In the Forty-seventh Report, page 16, this plant was confused with *S. Robbinsii* and subjoined to it as variety *subtomentosa*. It is clearly distinct.

Lysimachia vulgaris L.

The common loosestrife was doubtless introduced into this country as an ornamental garden plant, but it sometimes escapes from cultivation and is found growing freely in waste places and by roadsides. Cedarville, Herkimer county. June.

Symphytum asperrimum Sims.

Roadsides. Chili, Monroe county. *Mrs. J. H. McGuire*. Communicated by *J. B. Fuller*.

This has been introduced and cultivated as a fodder plant, but like many others it is disposed to run wild.

Fissidens incurvus Schwagr.

Rocks in damp places. Trout lake, St. Lawrence county. October. *Mrs. E. C. Anthony.*

Diplophyllum taxifolium Dumort.

Wet cliffs. Avalanche Pass, Essex county. August. *Mrs. E. G. Britton*. In the Manual this plant bears the name *Diplophyllum albicans* var. *taxifolium*.

Jungermannia autumnalis DC.

Trail to Rock falls, Adirondack mountains. August. *Mrs. Britton*.

Amanita magnivelaris n. sp.

Pileus convex or nearly plane, glabrous, slightly viscid when moist, even on the margin, white or yellowish-white; lamellæ close, free, white; stem long, nearly equal, glabrous, white, furnished with a large membranous white annulus, sheathed at the base by the appressed remains of the membranous volva, the bulbous base tapering downwards and radicating; spores broadly elliptical, .0004 in. long, .00024 to .0003 broad.

Pileus 3 to 5 in. broad; stem 5 to 7 in. long, 4 to 6 lines thick.

Solitary in woods. Port Jefferson, Suffolk county. July.

The species resembles *Amanita verna*, from which it is separated by its large persistent annulus, the elongated downwardly tapering bulb of its stem and especially by its elliptical spores.

Amanitopsis pusilla n. sp.

Pileus thin, broadly convex or nearly plane, subglabrous, slightly umbonate, even on the margin, pale brown; lamellæ narrow, thin, close, free, becoming brownish; stem short, hollow, bulbous, the bulb margined by the remains of the membranous volva; spores broadly elliptical, .0002 to .00024 in. long, .00016 broad.

Pileus about 1 in. broad; stem 8 to 12 lines long, 1 to 2 lines thick.

Grassy ground. Gouverneur, St. Lawrence county. September. *Mrs. Anthony*.

Lepiota subprocera Saut.

Round Lake, Saratoga county. August. This plant differs but little from *L. procera*, the parasol mushroom. Its smaller size and smooth unspotted stem are the chief marks of distinction. The

author of the species claims that the scales of its pileus are more persistent, but these are commonly persistent in undoubted *L. procera*.

***Lepiota Miamensis* Morg.**

Thin woods and heathy places. Fulton Chain, Herkimer county. August.

Our specimens differ slightly from the typical form in being smaller and in having the pileus sometimes umbonate. This is 6 to 12 lines broad and the stem is 12 to 18 lines long in our specimens.

***Lepiota rugoso-reticulata* Lorin.**

Open mossy or heathy places. Sand Lake, Rensselaer county, Saranac Lake, Franklin county, and Karner, Albany county.

This species resembles *L. amianthina* in color, but in size and shape and in the attachment of the lamellæ it approaches *L. granulosa*. Its distinguishing characters are its rugose or rugose-reticulated pileus and its strong odor. This is unpleasant and resembles that of vegetable mold or mossy humus. The surface of the pileus is commonly radiately wrinkled and the rugosity is usually more pronounced in the center of the pileus than toward or on the margin. Specimens sometimes occur that have the surface of the pileus even. The flesh is white when dry and the lamellæ are white. The stem is yellowish within but it has a white pith or is hollow. It is pale ochraceous below the slight or evanescent annulus. The pileus also is of this color and both are granulose. The margin of the pileus is often appendiculate with the remains of the veil.

***Tricholoma ionides* Bull**

Grassy ground and lawns. Gouverneur. Sept. Mrs. Anthony. The specimens are smaller than the typical form, the pileus being one inch or less in diameter.

***Clitocybe virens* Scop.**

Thin woods. Selkirk, Albany county. Aug. This species, like *C. odora*, has an agreeable fragrance, but it may be distinguished from that plant by its thin pileus and thin narrow crowded white lamellæ.

***Collybia nigrodisca* n. sp.**

Pileus thin, convex, glabrous, whitish or smoky white with a brown or blackish disk, flesh white; lamellæ rather broad, subdistant, rounded behind, adnexed, whitish inclining to creamy yellow; stem equal, hollow, pruinose, even or but slightly striate, whitish; spores subelliptical, .00024 to .0003 in. long, .00016 broad.

Pileus 1 to 1.5 in. broad; stem 1 to 1.5 in. long, about 2 lines thick.

Sandy soil. Wading River, Suffolk county. July.

In size and in the character of the lamellæ this plant bears some resemblance to *Marasmius oreades*, but in other respects it is far different.

***Collybia uniformis* n. sp.**

Pileus thin, hemispherical or convex, glabrous, hygrophanous, grayish-brown when moist, paler when dry, the thin margin even, at first involute or strongly incurved; lamellæ narrow, crowded, rounded behind, nearly free, whitish; stem equal, glabrous or slightly pruinose, hollow, grayish-brown, with a slight white mycelioid tomentum at the base; spores minute, subglobose, .00012 to .00016 in. broad.

Plant cæspitose; pileus 3 to 6 lines broad; stem about 1 in. long, 1 line thick.

Among mosses on much decayed wood. Saranac Lake. Sept.

The species belongs to the tribe Confertipedes and is related to *C. acervata*, *C. Familia*, etc. The plants are quite regular and uniform in size and shape.

***Pleurotus mastrucatus* Fr.**

Decaying wood. Bethlehem, Albany county. September. This species is very rare with us, but it is well marked by the gelatinous upper stratum of the pileus.

***Lactarius serifluus* Fr.**

Woods. Port Jefferson, Suffolk county. July.

The plants referred to this species in Report 24, p. 74, proved to be distinct and were published in Report 28, p. 50, under the name *Lactarius aquisfluus*. The plants now under consideration agree well with the description and figures of *L. serifluus* and are believed to be the true species.

***Russula anomala* n. sp.**

Pileus thin, fragile, nearly plane or somewhat centrally depressed, with no viscid or separable pellicle, distinctly striate on the margin, white, flesh white, taste acrid; lamellæ thin, moderately close, adnate, entire or with an occasional short one intervening, white, dusted with the white spores when dry; stem equal, solid or spongy within, white; spores subglobose, .0003 to .00035 in. broad.

Pileus 1 to 1.5 in. broad; stem 1 to 1.5 in. long, 3 to 4 lines thick.

Damp ground under trees. Port Jefferson. July.

This plant has the fragile pileus and striate margin characteristic of the tribe Fragiles, but its pileus is destitute of the viscid separable pellicle which also belongs to species of that tribe. If it had a viscid pileus it would approach *Russula fragilis* so closely that it might be regarded as a white variety of that species. It will probably be better to refer it to the tribe Rigidæ, notwithstanding the fragile character of its pileus and its distinctly striate margin.

***Russula pusilla* n. sp.**

Pileus very thin, nearly plane or slightly and umbilicately depressed in the center, glabrous, slightly striate on the margin, red, sometimes a little darker in the center, the thin pellicle separable, flesh white, taste mild; lamellæ broad for the size of the plant, subventricose, subdistant, adnate or slightly rounded behind, white, becoming yellowish-ochraceous in drying; stem short, soft, solid or spongy within, white; spores faintly tinged with yellow, .0003 in. broad.

Pileus scarcely 1 in. broad; stem 6 to 12 lines long, 2 to 3 lines thick.

Bare ground in thin woods. Port Jefferson. July.

The coloring matter of the pileus may be rubbed upon paper and produce on it red stains if the surface is previously moistened with water or dilute alcohol. This is one of the smallest *Russulas* known to me. The pileus is less than an inch broad and the stem less than an inch long in all the specimens seen by me. The species is closely allied to *R. puellaris*, and especially resembles the variety *intensior* in color. It differs in its smaller size, even or but slightly striate margin,

broad lamellæ and in the stem or flesh not becoming yellowish-spotted where touched.

***Russula ochrophylla* n. sp.**

Pileus firm, convex becoming expanded and often somewhat centrally depressed, even or rarely very slightly striate on the margin when old, purple or dark purplish-red, flesh white, purplish under the adnate cuticle, taste mild; lamellæ entire, a few of them forked at the base, subdistant, adnate, at first yellowish, at length bright ochraceous-buff, dusted by the spores when dry, the interspaces somewhat venose; stem equal or nearly so, solid or spongy in the center, reddish or rosy tinted, paler than the pileus; spores bright ochraceous-buff, globose, verruculose, .0004 in. broad.

Pileus 2 to 4 in. broad; stem 1.5 to 2.5 in. long, 6 to 10 lines thick.

Grassy ground under oak trees. Menands. July.

Var. *albipes* n. var. Pileus deep red; stem white; otherwise like the type.

In the size of the plant and the color of the pileus and stem this is almost exactly like *Russula drimeia*, as shown by Cooke's Illustr. pl. 1023. It also agrees in nearly all points with the description of that species, differing only in the color of the lamellæ and spores and in its mild taste. It is therefore with some hesitation that I have separated it as a distinct species. The flavor has been made a character of such prime importance in distinguishing the species of *Russula* that in Massee's recent work, *British Fungus Flora*, all the British species are grouped in two Sections, one of which depends upon its species having a mild taste, the other, an acrid one. It scarcely seems right to disregard a character to which so much importance has been given, and therefore I have recognized it. In the figure of *R. drimeia*, to which I have referred, the lamellæ are of a canary yellow, a color which I have not seen in the lamellæ of our plant. In it they are at first pale yellow, but when mature and in the dried state both they and the spores are almost exactly the color called in Ridgway's *Nomenclature of Colors*, ochraceous-buff. If there is any departure they are a shade brighter.

The mild taste of our plant led me to try its edible qualities. The flavor was not at all disagreeable, but the firmness of the flesh was

such that it might be called rather tough, and it would probably exclude this species from the first class of edible mushrooms. If stewed in milk or cream the liquid assumes some of the purplish or pinkish-purple hue of the mushroom. This coloration would probably be avoided if the mushrooms were peeled before stewing.

According to Cooke, the flavor of *R. drimeia* is "so intensely peppery that after tasting a small fragment, the tongue tingled for more than half an hour."

***Russula cyanoxantha* Fr.**

Grassy ground. Menands. August.

***Russula albella* n. sp.**

Pileus thin, fragile, dry, plane or slightly depressed in the center, even or obscurely striate on the margin, commonly white, sometimes tinged with pink or rosy red, especially on the margin, flesh white, taste mild; lamellæ entire, white, becoming dusted by the spores; stem equal, solid or spongy within, white; spores white, globose; .0003 in. broad.

Pileus 2 to 3 in. broad; stem 1 to 2 in. long, 3 to 4 lines thick.

Dry soil of frondose woods. Port Jefferson. July.

Closely allied to *R. lactea*, but differing in its fragile texture, entire lamellæ, more slender stem and in the pileus not cracking into areolæ.

***Marasmius impudicus* Fr.**

Under pine trees and sweet fern bushes. Delmar. September.

***Entoloma grande* n. sp.**

Pileus fleshy, thin toward the margin, glabrous, nearly plane when mature, commonly broadly umbonate and rugosely wrinkled about the umbo, moist in wet weather, dingy yellowish-white verging to brownish or grayish-brown, flesh white, odor and flavor farinaceous; lamellæ broad, subdistant, slightly adnexed, becoming free or nearly so, often wavy or uneven on the edge, whitish becoming flesh-colored with maturity; stem equal or nearly so, solid, somewhat fibrous externally, mealy at the top, white; spores angular, .0003 to .0004 in. long and broad.

Pileus 4 to 6 in. broad; stem 4 to 6 in. long, 8 to 12 lines thick.

Thin mixed woods. Menands. August.

The flavor of this mushroom is not at first disagreeable, but an unpleasant burning sensation is left in the mouth for a considerable time after tasting. It is therefore to be regarded with suspicion.

***Nolanea picea* Kalchb.**

Pileus thin, varying from broadly conical to convex or nearly plane, often irregular from its crowded or cæspitose mode of growth, even, covered with a grayish pruinosity, hygrophanous, blackish when moist, grayish-brown when dry, the thin even margin at first incurved and slightly tinged with red, extending beyond the lamellæ; lamellæ moderately close, rounded behind and slightly adnexed, often becoming ventricose with the expansion of the pileus, more or less serrate on the margin, whitish then flesh-colored; stem equal, often flexuose, stuffed or hollow, reddish-brown or blackish; spores narrowly elliptical, .0003 to .0004 in. long, .0002 broad.

Pileus 8 to 24 lines broad; stem 1 to 1.5 in. long, 1 to 2 lines thick. Among chips. Adirondack mountains. September.

This fungus has the fishy odor of such species as *Nolanea nigripes* and *N. pisciodora*, to which it is closely related, but from which it differs in its glabrous or merely pruinose pileus and in its coloration. We have referred it to *N. picea*, although it differs in some minor particulars from the description of that species. On this account we have recorded the description of our plant as made at the time of the collection of the specimens. It will be seen that there is no papilla on the pileus in our plant, yet this is given as one of the characters of the European species. Still the figures of it as given by Kalchbrenner himself and also by Gillet show no papilla, and for this reason especially we have the more confidently considered our plant as specifically the same.

***Pholiota rugosa* n. sp.**

Pileus thin, broadly conical or campanulate becoming expanded and often umbonate, hygrophanous, yellowish-red or ferruginous and striatulate on the margin when moist, pale yellow or buff and commonly rugose when dry; lamellæ close, adnexed, yellowish-white

or cream-colored becoming ferruginous or brownish-ferruginous with age, white and minutely denticulate on the edge; stem flexuose, equal or slightly thickened toward the base, hollow, fibrillose or sometimes squamulose below the annulus, pruinose or mealy above, pallid, the annulus membranous, white or whitish, radiately striate on the upper surface; spores narrowly elliptical, .0004 to .0005 in. long, .00024 to .00028 broad.

Pileus 6 to 12 lines broad; stem 1 to 2 in. long, 1 to 2 lines thick.

Ground among decaying chips. Adirondack mountains. September.

The fibrils of the lower part of the stem have a tawny hue. The species is closely related to *P. togularis*, from which it is separated because of the hygrophanous pileus and the adnexed lamellæ. From *P. blattaria* the different color adnexed lamellæ and larger spores separate it. The peculiar upper surface of the annulus is similar to that indicated in the figure of *P. togularis* var. *filaris*, as given by Fries.

***Pholiota confragosa* Fr.**

Decaying wood in woods. Adirondack mountains. September.

This is apparently a variable species. Our specimens resemble more closely the long-stemmed form figured by Fries, but this form also sometimes has the slight but evanescent hairy flocs or scales when young, although the figures do not show them. European authors do not agree in the characters ascribed to the spores of this species; one describing them as "elliptic-oblong, ferruginous 8x4," another as "subellipsoid or sphaeroid-ellipsoid, yellowish, 5-6x3-5 or 12x5." These can not all be correct, and it is probable that two or three species have been confused. In our plant the spores are really naviculoid or boat shaped. They are about .0003 in. long, and .00016 or .0002 broad, according to the position they are in, being more narrow when viewed edgewise than when viewed flatwise. In color they are pale ferruginous or yellowish-ferruginous. *P. unicolor*, according to the description, has broader lamellæ and longer spores.

***Flammula magna* n. sp.**

Pileus fleshy, broadly convex, soft, dry, fibrillose and somewhat virgate, pale yellow or buff, the margin commonly becoming revo-

lute with age, flesh whitish or yellowish; lamellæ close, adnate or slightly decurrent, often crisped or wavy toward the stem, about three lines wide, ochraceous; stem equal or thickened toward the base, fleshy-fibrous, solid, elastic, fibrillose, colored like the pileus, brighter yellow within; spores subelliptical, ochraceous, .0004 in. long, .00024 broad.

Cæspitose; pileus 4 to 6 in. broad; stem 3 to 4 in. long, 8 to 12 lines thick.

About the base of trees. Westchester county. October. *Basset Jones*.

This is a large and showy species. The stems are sometimes united at the base into a solid mass. The young lamellæ are probably yellow, but I have seen only mature specimens.

***Flammula rigida* n. sp.**

Pileus thin, rather firm and rigid, convex becoming nearly plane or centrally depressed, sometimes wavy on the margin, glabrous, hygrophanous, rusty-tawny or subferruginous when moist, buff or grayish-buff when dry, flesh concolorous; lamellæ moderately close, adnate, creamy white, becoming rusty tan color or subferruginous; stem equal or nearly so, tough, slightly striate, colored like the pileus, with a compact white tomentum on the lower part or at the base; spores broadly elliptical, .0003 to .00035 in. long, .00016 to .0002 broad.

Pileus 1 to 1.5 in. broad; stem 1 to 2 in. long, 1.5 to 3 lines thick.

Chip dirt about an old lumber camp. Adirondack mountains. September.

The plants are gregarious and by their mycelium they adhere closely to chips and fragments of wood from which they grow and which are usually pulled up with them when they are gathered.

***Inocybe unicolor* n. sp.**

Pileus at first conical or very convex, becoming expanded or broadly convex, firm, tomentose-squamulose, pale-ochraceous or grayish-ochraceous, flesh white; lamellæ broad, subdistant, somewhat ventricose, pale-ochraceous when young, tawny-brown when old; stem slender, equal, firm, flexuose, solid, squamulose, colored

like the pileus; spores tawny-brown, elliptical, even, .0004 to .0005 in. long, .0002 to .00025 broad.

Pileus 8 to 12 lines broad; stem 1 to 1.5 in. long, 1 to 2 lines thick.

Clay soil. Menands. July. This plant resembles *Inocybe ochracea*, from which it may be separated by its more highly colored squamulose stem and its larger spores. It belongs to the tribe Squarrosæ.

Cortinarius nitidus Fr.

Swampy woods. Gansevoort. August.

Paxillus Curtisii Berk.

Decaying pine wood and stumps. Mechanicville and Round Lake. September and October. The description of this species appears to have been omitted from Saccardo's *Sylloge Fungorum*. It resembles *Paxillus panuoides* in size and general habit, but it differs from that species very decidedly in its orange-colored narrow lamellæ, which are more wavy or crisped and more branched and connected. Sometimes they anastomose throughout their whole length, sometimes they are forked near the margin of the pileus and abundantly crisped and connected toward the base. The spores are minute, .00016 in. long, .00008 broad. The color of the pileus in the typical form is said to be sulphur-yellow and the substance tawny. In our specimens the pileus is commonly tawny and the flesh yellow, just the reverse of the characters ascribed in the type. The pileus is apt to become blackish in drying, either wholly or in part, and the plant emits a peculiar strong odor, which it retains for a long time even in the dried state.

Stropharia siccipes Karst.

On dung in pasture. Jordanville, Herkimer county. June.

This dung-inhabiting mushroom is related to *Stropharia stercorearia* and *S. semiglobata*, but it differs from both in its dry flocculose and minutely fibrillose stem. The veil is white and often adheres in fragments to the margin of the pileus, thereby making an approach to the genus *Hypholoma*. In such cases the annulus is very slight or wholly wanting. The stem is stuffed with a white cottony pith, but it sometimes becomes hollow with age. The pileus is viscid when moist and quite variable in color.

***Hypholoma capnoides* Fr.**

On and about spruce stumps and decaying wood of spruce. Adirondack mountains. September.

***Psathyra umbonata* n. sp.**

Pileus submembranous, campanulate, umbonate, hygrophanous, purplish-brown and striatulate when moist, grayish-white when dry, even or slightly rugulose, atomate, the umbo commonly paler than the rest; lamellæ rather broad, moderately close, ventricose, subadnate, brownish-red, becoming purplish-brown and finally almost black; stem slender, flexuose, hollow, white, commonly hairy-tomentose at the base and slightly mealy at the top; spores blackish-brown or almost black, .0005 to .0006 in. long, .0003 broad.

Chip dirt. Lake Pleasant. July.

The species is apparently related to *Psathyra corrugis*, but differs in the color of the pileus and of the young lamellæ and in the flexuose stem. The umbo is very prominent and when the pileus begins to lose its moisture the umbo becomes very conspicuous, for it first loses color and becomes much paler than the rest, appearing like a whitish knob in the midst of a dark background. The margin of the young pileus is straight and sometimes shows vestiges of a slight grayish fibrillose veil. In dried specimens the pileus is apt to become sulcate-striate or radiately sulcate.

***Coprinus quadrifidus* n. sp.**

Pileus thin, at first oval, then campanulate, finally more or less expanded with the margin revolute, when young adorned with a superficial floccose-tomentose veil, which soon separates into evanescent flakes or scales and reveals the finely striate surface of the pileus, whitish becoming grayish or grayish-brown with age, the margin often wavy or irregular; lamellæ broad, thin, crowded, free, at first whitish, then dark purplish-brown, finally black; stem equal or slightly tapering upward, hollow, floccose-squamulose, white, sometimes with a slight evanescent floccose ring near the base; spores .0003 to .0004 in. long, .00016 to .0002 broad.

Plant gregarious or cæspitose; pileus 2 to 3 in. broad; stem 3 to 4 in. long, 3 to 4 lines thick.

Damp vegetable mold or much decayed wood under basswood trees. Portage. June.

When mature the pileus becomes perforated in the center and soon splits into three to five, commonly four, segments, the divisions extending a short distance down the stem, allowing the parts of the pileus to droop on the recurved upper parts of the stem. This remarkable feature of the species has suggested the specific name. The plant is referable to the tribe Tomentosi, but the pileus soon becomes glabrous. The veil is whitish or slightly yellowish. The spores appear at first to be brownish-black, but they become black after a short exposure.

***Psathyrella hirta* n. sp.**

Pileus thin, hemispherical or convex, adorned when young with erect or spreading tufts of white, easily detersible and quickly evanescent hairs, hygrophanous, brown or reddish-brown and slightly striatulate when moist, pale grayish-brown or dingy whitish when dry, flesh subconcolorous; lamellæ broad, moderately close, adnate and often furnished with a decurrent tooth, at first pallid, becoming blackish-brown or black; stem flexuose, squamose, hollow, shining, white; spores elliptical, black, .0005 to .00055 in. long, .00025 to .0003 broad.

Subcæspitose; pileus 4 to 6 lines broad; stem 1 to 2 in. long 1 to 1.5 lines thick.

Dung or dungy ground in shaded places. Adirondack mountains. July.

The species has some points of similarity to *Psathyra gossypina* and *P. pennata*, but its adnate lamellæ and black spores distinguish it from both. The hairs of the pileus are coarse and vanish so easily that they are preserved with difficulty in the dried specimens.

***Boletus auripes* n. sp.**

Pileus convex, subglabrous, yellowish-brown, sometimes cracking in areas when old, flesh yellow, fading to whitish with age; tubes nearly plane, their mouths small, subrotund, at first stuffed, yellow; stem nearly equal, solid, even or slightly reticulated at the top, bright yellow, a little paler within; spores ochraceous-brown tinged with green, .0005 in. long, .0002 broad.

Pileus 3 to 6 in. broad; stem 3 to 5 in. long, 8 to 12 lines thick.

Under mountain laurel, *Kalmia latifolia*. Port Jefferson. July.

The whole plant, except the upper surface of the pileus, is of a beautiful yellow color. The stem is sometimes more highly colored than the tubes. The species is referable to the tribe Edules.

***Boletus firmus* Frost.**

Thin woods. Ballston lake. August. The spores in our plant are broader than the dimension given in the description. They are .0005 in. long and .00024 broad. In other respects the agreement with the description is very close.

***Boletus fumosipes* n. sp.**

Pileus convex or nearly plane, minutely tomentose, sometimes minutely rivulose, dark olive-brown, flesh whitish; tubes at first nearly plane, becoming convex with age, their mouths whitish when young, becoming yellowish-brown, changing to bluish-black where bruised; stem equal, solid, smoky-brown, minutely scurfy under a lens; spores purplish-brown, .0005 to .0006 in. long, .0002 to .00025 broad.

Pileus 1 to 2 in. broad; stem 1 to 2 in. long, 3 to 4 lines thick.

Woods. Port Jefferson. July.

This species resembles small dark colored forms of *B. chrysenteron*, and this resemblance is still more noticeable in those specimens in which the pileus cracks in areas, for in these the chinks become red as in that species. The different color of the stem and tubes will at once separate these species.

***Boletus illudens* n. sp.**

Pileus convex, dry, subglabrous, yellowish-brown or grayish-brown, sometimes tinged with red, especially in the center, flesh pallid or yellowish; tubes bright yellow, plane or somewhat convex when old, adnate, their mouths angular or subrotund, often larger near the stem; stem nearly equal, sometimes abruptly pointed at the base, glabrous, pallid or yellowish, coarsely reticulated either wholly or at the top only; spores oblong or subfusiform, yellowish-brown tinged with green, .00045 to .0005 in. long, .00016 to .0002 broad.

Pileus 1.5 to 3 in. broad; stem 1.5 to 2.5 in. long, 3 to 5 lines thick. Woods and copses. Port Jefferson. July.

This species bears a strong resemblance to *B. subtomentosus*, with which it doubtless has been confused. The strong point of distinction is in the reticulated stem, which should place it among the *Calopodes*. In large specimens these coarse reticulations extend to the base of the stem, in smaller ones they are often limited to the upper part. The spores when first dropped on white paper are dark green or olive green, but they fade to a yellowish-brown, barely tinted with green.

***Boletus rubropunctus* n. sp.**

Pileus convex, glabrous, reddish-brown, flesh yellowish, unchangeable; tubes nearly plane, depressed about the stem, their mouths small, round, bright golden yellow, not changing color where bruised; stem firm, solid, tapering upward, yellow, punctate with reddish dots or squamules; spores olive-green, .0005 in. long, .00016 to .0002 broad.

Pileus 1 to 2 in. broad; stem 1 to 2 in. long, 3 to 6 lines thick.

Woods. Port Jefferson. July. Cold Spring Harbor. *H. C. Beardslee*.

This is a pretty boletus, well marked by the red dots of the stem. It is apparently a very rare species. *B. radicans* is said to have the stem sprinkled with red particles, but that is a larger plant with the margin of the pileus persistently involute or incurved and with a radicating stem, characters which are not shown by our fungus.

***Polyporus umbellatus* Fr.**

Gouverneur, St. Lawrence county. *Mrs. E. C. Anthony*.

***Hydnum fennicum* Karst.**

Woods, on naked soil or among fallen leaves. Port Jefferson. July.

Our plant differs in some respects from the description of the European species, but its general correspondence is so close that it can scarcely be specifically distinct. The European fungus is said to have an acerb taste, approaching, in this respect, *H. acre*. But this species

is described as having a bitterish peppery taste. In our fungus the taste is bitter, resembling that of *Boletus felleus*. It has a farinaceous odor and a slight farinaceous flavor with the first taste, but this is soon overcome by the very bitter flavor.

***Hydnum albonigrum* n. sp.**

Pileus convex or nearly plane, broadly obconical, tough but soft and densely tomentose on the upper surface, buff-brown or smoky brown, often wholly covered with a whitish downy tomentum, sometimes on the margin only, substance within soft tomentose and buff-brown in the upper stratum, the lower half hard and black; aculei short, at first white, then whitish or grayish; stem short, often irregular compressed or confluent, blackish when moist, buff-brown when dry, covered with a thick dense tomentum, which is frequently more abundant toward the base, hard and black within; spores white, globose, .00016 to .0002 in. broad.

Pileus 1 to 3 in. broad, sometimes two or three confluent; stem 1 to 2 in. long.

Ground in mixed woods. Gansevoort. August.

This species is apparently near *H. nigrum*, but it is well marked by the peculiar structure of the pileus which is similar to *H. mirabile* in having the upper half densely tomentose and soft, the lower half hard and black and continuous with the stem. Like that species also the tomentum of the pileus and stem imbibes much moisture in wet weather, which may be pressed out in drops. It is also near *H. velutipes*, but according to the description, that species is fuscous murine in color, paler within and its spores are smaller, and no mention is made of the difference in texture of the upper and lower part of the pileus.

***Hydnum vellereum* n. sp.**

Pileus nearly plane, tough, subcoriaceous, sometimes centrally uneven or colliculose, downy-tomentose, whitish or cinereous from the overspreading tomentum, or somewhat brownish-ferruginous and whitish on the margin, within fibrous, ferruginous-brown; aculei short, about one line long, white or whitish inclining to brownish-ferruginous; stem short, colored like the pileus and often covered

with a whitish tomentum; spores white, globose, minutely echinulate, .00016 in. broad.

Pileus 6 to 18 lines broad; stem 6 to 10 lines long, about 2 lines thick.

Gregarious among fallen leaves in woods. Port Jefferson. July.

This species appears to be very much like the preceding one, from which it is separated by its smaller size and the paler brownish or ferruginous-brown substance of the pileus and stem.

***Hydnum spongiosipes* n. sp.**

Pileus convex, soft, spongy-tomentose, but tough in texture, ferruginous-brown, the lower stratum more firm and fibrous, but concolorous; aculei slender, 1 to 2 lines long, ferruginous-brown, becoming darker with age; stem hard and corky within, externally spongy-tomentose, colored like the pileus, the central substance often transversely zoned, especially near the top; spores subglobose, nodulose, purplish-brown, .00016 to .00024 in. broad.

Pileus 1.5 to 4 in. broad; stem 1.5 to 3 in. long, 4 to 8 lines thick.

Woods. Rensselaer and Saratoga counties. August.

This plant was formerly referred to *Hydnum ferrugineum* Fr., to which it is closely related and of which it may perhaps be a variety. But having observed it for several years I find it constantly differing from the Friesian plant as figured and described in *Icones Hymenomycetum*, in having the pileus convex and the stem covered with a dense spongy tomentum, colored like the pileus and quite distinct in texture from the hard central part. The figure of *H. ferrugineum* shows a depressed pileus and a stem paler in color and of a uniform texture that is without any external tomentose coating. Nor does the description ascribe such a character to the stem of the European plant.

***Hydnum mirabile* Fr.**

A plant answering fairly well to the description and figure of this species was found in the sandy soil of woods near Port Jefferson. Its structure is of that peculiar character ascribed by Fries to his species, and which apparently suggested the specific name, *mirabile*. Its odor when the flesh is cut or broken, is farinaceous and its taste is also

farinaceous at first, but quickly becomes hot or peppery like the taste of acrid species of *Lactarius* and *Russula*. It is to be regretted that Fries neglected to note the flavor of species of *Hydnum*, for it is of value in their identification.

The substance of the stem and pileus, except the superior stratum of the latter, is brittle when fresh, but compact and slightly or lineately zoned within, a character not ascribed by Fries to his plant. It becomes hard and woody when dry. It might be called compactly fleshy when fresh and moist, and then it has some points of agreement with *H. acre* Quel. But Quelet fails to notice any difference in texture in the upper and lower strata of the pileus in his plant, a feature well shown by our specimens and strongly emphasized by Fries in the description of *H. mirabile*. For this reason we have referred our plant to *H. mirabile*, although otherwise agreeing quite well with the description of *H. acre*. The description of *H. mirabile* attributes an alutaceous color to the pileus, but the figure indicates a pale yellow color. In our plant the color varies from grayish-buff to brownish-buff. Possibly our plant may prove to be a species distinct from both.

***Hydnum separans* n. sp.**

Resupinate, white; subiculum membranous, at first pure white, becoming yellowish or cream color with age; aculei subulate, glabrous, crowded, 2 to 3 lines long, fragile, easily separating from the subiculum and leaving in it alveolar impressions; spores globose, colorless, .00016 in. broad.

Much decayed wood of deciduous trees. Adirondack mountains. July.

After the teeth have been separated from the subiculum it resembles somewhat a shallow-pored species of *Poria*. By this character, the thinner subiculum and the smaller spores the species may be separated from *H. mucidum*, to which it is allied.

***Hydnum serratum* n. sp.**

Resupinate, white; the subiculum thin, somewhat gelatinous, livid white or bluish-tinted; aculei crowded, short, somewhat confluent in small fasciculate compact clusters, compressed, serrate on the sides and at the apex, white, sometimes slightly tinged with straw color.

Decorticated wood of spruce, *Picea Mariana*. Adirondack mountains. September.

This fungus forms patches several inches in extent. In external appearance it is suggestive of *H. Artocreas*, but it is much thinner, with shorter, more compressed and serrate teeth. This last character will also separate the species from *H. fasciculare*.

Hydnochaete n. gen.

Subiculum effused, submembranous, floccose-tomentose, setigerous; aculei subulate, setigerous.

A hydroid genus of which the typical species is like a resupinate Hydnum or more nearly like *Caldesiella ferruginosa*, but it differs in having its hymenium furnished with small smooth colored setæ, which gives to the Hydnei a genus corresponding to *Hymenochaete* among the Thelephorei and to *Mucronoporus* among the Polyporei.

Hydnochaete setigera n. sp.

Subiculum thin, at first grayish-tawny or pale tawny, tomentulose, setigerous, the margin even and concolorous or sometimes somewhat fimbriate and whitish or grayish-white; aculei at first short, subconical, blunt, pale tawny, becoming subulate with age, about one line long, villosely setigerous, persisting through the winter and becoming ferruginous or dark ferruginous, the plant becoming stratosed by the development of a new subiculum and new aculei over the old ones each year, the setæ simple or branched, .0016 to .0024 in. long, slender, sharp pointed; spores pale, subglobose or broadly elliptical, .0002 to .0003 in. long.

Decaying wood of pine, spruce and hemlock. Adirondack mountains. July to September. I have also received specimens of the first year's growth of this fungus from Professor Underwood, who collected them on the White mountains.

Although forming strata, this species must be very distinct from the plant described by Rev. M. J. Berkeley under the name *Hydnum stratosum*. In its first year it is so similar in general appearance to *Caldesiella ferruginosa* Sacc., (*Hydnum ferruginosum* Fr.) that by a careless observer it might easily be mistaken for it, but its paler color and the presence of setæ will at once separate it.

The setæ of the aculei are mostly simple and project at right angles from them, but those of the subiculum are generally longer and are often stellately or radiately branched from a common base. Rarely one or two short branches project horizontally from near the base. The plants form patches varying from several inches to several feet in extent. They begin to develop in June or July and apparently do not always become mature before September.

Radulum Pini-Canadensis Schw.

Bark of hemlock, *Tsuga Canadensis*. Gansevoort. August.

Odontia rimosissima n. sp.

Effused, very thin, determinate, crustose, adnate, abundantly rimose, at first whitish, then pallid or somewhat grayish-ochraceous; granules very minute, scarcely visible to the naked eye, subconical, distant or crowded, bearing one or several setæ at the apex; spores broadly elliptical, commonly uninucleate, .0002 to .00024 in. long, .00014 to .00016 broad.

Wood and bark of alder, *Alnus incana*. Sand Lake. November.

Coniophora subochracea n. sp.

Effused, membranous, the subiculum composed of whitish webby filaments; hymenium greenish-ochraceous, even or minutely papillose, finally cracking and revealing the thin subiculum and the matrix; spores numerous, broadly elliptical, colored, .00024 in. long, .00016 broad.

Decaying wood and bark in dark damp places. Menands. October.

Clavaria platyclada Pk.

Woods and swamps. Adirondack mountains. September.

Near *C. fusiformis*, but separated because of its flattened obtuse clubs tapering below into a whitish base.

Exobasidium Peckii Halstd.

Living leaves and flowers of stagger bush, *Andromeda Mariana*. Long Island. June. F. C. Stewart.

***Phyllosticta limitata* n. sp.**

Spots orbicular, small, commonly 1 to 3 lines broad, sometimes confluent, brown or reddish-brown, sometimes becoming gray or having a grayish center, often sterile, definitely limited and surrounded by a narrow slightly elevated brown or blackish-brown margin; perithecia epiphyllous, minute, few, punctiform, black; spores elliptical, .0003 in. long, .00016 broad.

Living leaves of apple, *Pyrus Malus*. Westbury, Queens county. June. Stewart.

***Phyllosticta Apocyni* Trel.**

Living leaves of *Apocynum androsæmifolium*. Mechanicville. July.

***Dendrophoma crassicolis* S. & S.**

Dead bark of ash, *Fraxinus Americana*. Meadowdale. May.

***Diplodina quercina* n. sp.**

Perithecia small, .0014 to .0016 in. broad, numerous, erumpent, black; spores narrow, subfusiform, obscurely uniseptate, .0004 to .0006 in. long, .00016 broad, usually containing 2 to 4 nuclei.

Dead twigs of oak. Jamaica. April. Stewart.

***Pestalozzia breviseta* Sacc.**

Living leaves of apple. Port Jefferson. July.

***Puccinia Prenanthis* Fckl.**

Living leaves of rattlesnake root, *Prenanthes alba*. Cedarville, Herkimer county. June. The æcidial state is *Æcidium Prenanthis*.

***Æcidium Rhamni* Pers.**

Living leaves of the alder-leaved buckthorn, *Rhamnus alnifolia*. Jordanville, Herkimer county. June. The peridia in our specimens are shorter than in the type.

***Æcidium Senecionis* Desm.**

Living leaves of golden ragwort, *Senecio aureus*. Cedarville. June. This is the æcidial state of *Puccinia conglomerata*.

Coleosporium Campanulæ Wint.

Living leaves of *Campanula rapunculoides*. Earlville, Madison county. August. *L. M. Underwood*.

Septoria Lobeliæ-syphiliticæ Henn.

Living leaves of *Lobelia syphilitica*. Mechanicville, Saratoga county. September. The spores in this species are larger than those of *S. Lobeliæ*.

Oidium erysiphoides Fr.

Living leaves of *Potentilla Norvegica*. Karner, Albany county. July. The affected plant has a very unthrifty, deformed appearance.

Ædocephalum intermixtum n. sp.

Fertile hyphæ erect, simple, continuous or with one or two obscure septa near the base, white, about .0003 in. thick, terminating above in a slightly inflated verrucose vesicle; spores elliptical or obovate, even, hyaline, .0005 to .001 in. long, .0004 to .0006 broad.

Dead stems of *Iris Germanica*, growing among and intermingled with *Macrosporium Iridis*.

Sporotrichum entomophilum n. sp.

Hyphæ very slender, .0001 in. thick, branched, forming a thin white tomentose stratum over the matrix; spores subelliptical, .00016 to .0002 in. long.

Larvæ of elm leaf beetle, *Galerucella luteola*. Albany. September. *J. A. Lintner*.

Ramularia occidentalis E. & K.

Living or languishing leaves of great water dock, *Rumex Britanica*. Mechanicville. September.

Ramularia cylindriopsis n. sp.

Hyphæ very short or but little diverse from the spores; spores very variable, elliptical oblong or cylindrical, catenulate, continuous, .0003 to .001 in. long, .00016 to .0002 broad.

Living leaves of stagger bush, *Andromeda Mariana*. Westbury, Queens county. June. *Stewart*.

The fungus occupies the whole lower surface of the leaves and it overspreads them with a white flocculent stratum of its spores. It is similar in habit to *R. effusum*, which attacks the leaves of the common huckleberry, *Gaylussacia resinosa*. It sometimes kills both leaves and twigs. It differs from *R. Andromedæ* in its shorter hyphæ, broader spores and different habit.

***Verticillium enecans* Speg.**

On some unrecognized species of *Marasmius*. Voorheesville, Albany county. August.

The parasite completely overspreads the host plant with a thin white felty covering of its hyphæ and soon kills it.

***Cladosporium caricicolum* Ck.**

Living leaves of carices. Jordanville. June.

The leaves in our specimens were attacked near the middle and so weakened by the fungus that the apical half had drooped and withered.

***Heterosporium gracile* Sacc.**

Dead and languishing leaves of flower-de-luce, *Iris Germanica*. Menands. September.

***Phragmotrichum Chailletii* Kze.**

Cone scales of white spruce, *Picea Canadensis*. Minerva, Essex county. July. I am not aware that this interesting and peculiar fungus has before been detected in this country.

***Macrosporium Iridis* C. & E.**

Dead flower stems of flower-de-luce, *Iris Germanica*. Menands. September.

***Macrosporium Amaranthi* Pk.**

Living leaves of goose-foot, *Chenopodium album*. Mechanicville, Saratoga county. October. (Bull. Torr. Bot. Club, Vol. 22, p. 493, 1895.)

***Septonema toruloideum* C. & E.**

Decaying pine wood. Menands. October.

Entyloma Veronicæ (Halst.) Lager.

Living leaves of American speedwell, *Veronica Americana*. Jordanville. June.

Peronospora calotheca De By.

Living leaves of *Galium triflorum*. Cedarville, Herkimer county. June.

The leaves of badly infested plants have a starved appearance and do not attain their usual size, and the plant itself is small and discolored.

Exoascus Cerasi (Fckl.) Sadeb.

Living leaves of sweet cherry, *Prunus Avium*. Westbury, Cutchogue, Queens, Floral Park and Flatbush, Long Island. May. Stewart.

Peziza subumbrina Boud.

Black muck soil in woods. Mechanicville. July. The spores in our specimens are binucleate. They are at first smooth, but they become verrucose with age.

Spathularia rugosa n. sp.

Club compressed, rugose, oblong, obovate or spatulate, sometimes irregular or long decurrent, pale yellowish; stem subequal, subterete, often minutely pruinose-tomentose or subvelvety, especially toward the base, whitish or pallid; asci clavate, gradually tapering below into the very short stem, .003 to .004 in. long, .0004 to .0005 broad; spores filiform, .0016 to .0024 in. long, about .00008 broad; paraphyses filiform very slightly thickened at the top and more or less curved.

Growing in circles under or near coniferous trees. Old Forge, Herkimer county. August. *

In size and color this fungus is very much like *S. flavida* Pers., to which it was referred as variety *rugosa* in Report 39, p. 58.

It differs from that species in its very rugose club, its rather shorter spores, its habit of growing in circles and in the less glabrous stem. Possibly it may not be distinct from *S. crispata* Fckl., which was erroneously referred to *S. crispata* Fr., according to Sylloge. The description of Fuckel's plant is too brief to be satisfactory.

Admitting the specific value of this plant and of *S. velutipes* and substituting for *S. flavida* the earlier name *S. clavata* Schæff., which is adopted in Sylloge, we have three New York species. In the annexed table their differentiation is indicated.

Stem whitish or pallid	I
Stem bay or bay-brown	<i>S. velutipes.</i>
I Club even or wavy	<i>S. clavata.</i>
I Club rugose	<i>S. rugosa.</i>

***Cenangium Abietis* (Pers.) Rehm.**

Dead bark of white pine, *Pinus Strobus*. Delmar, Albany county. August.

***Diaporthe decipiens* Sacc.**

Dead branches of water beech, *Carpinus Caroliniana*. New Baltimore, Greene county. June.

***Phyllachora Junci* (Fr.) Fckl.**

Dead stems of slender rush, *Juncus tenuis*. Cedarville, Herkimer county. June.

***Xylaria castorea* Berk.**

Prostrate trunks of beech, *Fagus Americana*. Adirondack mountains. September.

(D.)

REMARKS AND OBSERVATIONS.

***Nymphæa reniformis* DC.**

Great South Bay, near the head of Lake Champlain. *S. H. Burnham*. This station extends the known range of the species northeastward.

***Corydalis glauca* Pursh.**

A white-flowered form was found growing with the common form on the summit of Altar or Cobble mountain, near Lake Placid.

***Nasturtium sylvestre* R. Br.**

Banks of the Genesee river near the southern and also near the northern boundary of the city of Rochester. Collected by *Mrs. J. H.*

McGuire; communicated by *Mr. J. B. Fuller*. The yellow cress is an introduced and sparingly naturalized plant. Specimens were collected several years ago near Flushing, Long Island.

Lepidium campestre Br.

The field pepper grass is an introduced species, which is gradually spreading through the State, and is attracting some attention as a pernicious weed. Mr. Fuller sends specimens with the following note: "It is frequent in grain fields in the western part of Monroe county, where it is locally known as 'long John.' It is rarely observed in the eastern part of the county."

Arenaria Grœnlandica Spreng.

Unusually large specimens of this plant were collected near Lake Mohonk, Ulster county. They were still flowering early in October.

Silene antirrhina divaricata Robinson.

Dry rocky woods. Lansingburg. July. The branches in our specimens are widely spreading and the flowers apetalous.

Tilia pubescens Ait.

Near Riverhead, Suffolk county. July. Our specimens are from the same source as those mentioned in Sargent's *Trees of North America*, as coming from this locality. The station was discovered by *Mr. E. S. Miller*.

Tilia heterophylla Vent.

Camillus and Marcellus Station, Onondaga county. June. This indicates a more northern range for the species than has hitherto been attributed to it. The flower buds had not yet opened when the specimens were collected.

Flœrkea proserpinacoides Willd.

The false mermaid is rare in the eastern part of our State and in the New York Flora it is credited to the western part only. There is, however, a station in a low piece of woods near Meadowdale, Albany county, in which it grows in considerable abundance.

Euonymus atropurpureus Jacq.

Banks of the Genesee river at Glen Iris, Wyoming county. June.

Fragaria Virginiana Mill.

The wild strawberry is a variable plant and indicates in the fields its tendency to run into numerous varieties. Near Meadowdale a form was found bearing flowers scarcely more than half the usual size. These small flowers are followed by very small fruit. The breadth of the receptacle of the flower indicates in some degree the size of the resulting fruit. From a broad receptacle we would expect a large fruit, from a narrow one, a small fruit. Possibly some of the forms referred to this species will yet be shown to be distinct species.

Zizia cordata DC.

A form with the radical or basal leaves trifoliate was found growing with the ordinary form in the borders of woods near New Baltimore, Greene county. In one or two instances both entire and trifoliate basal leaves were found on the same plant.

Viburnum lantanoides Mx.

The hobble bush is one of the prevailing shrubs of the Adirondack forests. Wherever we go in this mountainous region we find it extending its long horizontal branches as if to welcome us to its forest home with outstretched arms, but really to impede our steps, for the interlocking of the branches of neighboring plants or the rooting at the tip of an occasional deflexed branch makes traveling difficult and sometimes causes a trip and a fall.

This shrub is generally three or four feet high and bears a few horizontally spreading branches which are nearly as long as the parent stem. But plants were noticed the past summer in the southern part of Essex county between the Boreas and Hudson rivers that were ten feet high. These tall individuals generally had shorter and more numerous branches than their more lowly neighbors, and these were ascending in direction, diverging from the stem at a smaller angle than usual. In searching for the cause of this excessive and peculiar growth it was found that these tall specimens generally grew in

clumps or clusters of several individuals or else were closely crowded by other shrubs or small trees. In either case the tendency would be to stimulate an upright growth in the effort of the plant to get into more and better light, and to retard or hinder the horizontal growth of the branches. The result is seen when trees grow close to each other in groves or forests. They grow taller and have more slender elongated trunks than when they grow singly or widely scattered in open fields. A fertile soil and a constant supply of the necessary moisture are doubtless contributing conditions. This plant evidently delights in the shade of trees and therefore in a constantly though perhaps a moderately moist soil, for it quickly disappears when the trees are cut away and it is exposed to the full rays of the sun.

***Symphoricarpos vulgaris* Mx.**

The Indian currant or coral berry is not common in our State. There is a station for it near Newtonville, the only one known to me in Albany county. Possibly the plants have been introduced there from some western locality.

***Aster sagittifolius* Willd.**

The arrow-leaved aster is credited in the New York Flora to Yates county. It is now quite plentiful in the northern part of the Hudson river valley. It is found about Mechanicville and extends northward to Bemus Heights. It has also been collected by Mr. Burnham near Sandy Hill, Washington county, and probably occurs in intermediate localities.

***Solidago puberula* Nutt.**

"Sandy soil, Maine to Virginia and southward, mostly near the coast," is given in the Manual as the habitat and range of this species. In our State it frequently occurs in gravelly soil and in rocky places in the mountains remote from the seacoast. It has been found on the Shawangunk mountains in Ulster county, among the Catskill mountains and in the Adirondack mountains. It has been sent from rocky places in St. Lawrence county by Mrs. Anthony and from rocky hills near Fort Ann, Washington county, by Mr. Burnham. In these plants the hoary puberulence of the typical form is scarcely noticeable and the achenes have a few scattered hairs on the upper part, otherwise I see no distinct variation from the typical form.

***Pyrola uliginosa* T. & G.**

In the Manual this plant is considered as a mere variety of *P. rotundifolia*. But having seen living specimens in the Mud lake locality in the southern part of Herkimer county, where it was discovered by Mr. Paine many years ago, I am disposed to consider it a distinct species and would restore it to the place assigned it by Dr. Torrey in the New York Flora. Its habitat is peculiar and its flowers are beautiful.

***Pyrola secunda pumila* Gr.**

The peaty bog at the east end of Mud lake is still a station for this very small or dwarfish pyrola. It was found here by Mr. Paine more than thirty years ago. The same variety occurs in the Adirondack mountains, where it passes into the typical form.

***Ilex monticola* Gr.**

Lake Mohonk, Ulster county. Few localities in the State are richer in botanical novelties and rare species of plants than this. It seems to be common ground where mountain loving species from the north and from the south meet and intermingle.

***Symphytum officinale* L.**

Roadsides. Pike, Wyoming county. June. The purplish-flowered form.

***Myosotis palustris* With.**

This introduced plant is abundant along Ilion creek between Ilion and Cedarville.

***Phlox subulata* L.**

This early flowering, highly ornamental and sometimes cultivated plant was formerly abundant on the west bank of the Genesee river three and a half miles from its mouth. It is still found on the east bank. It occurs also at Caledonia, Livingston county. Fuller.

***Gerardia flava* L.**

A singular form of this plant was collected near Port Jefferson. It has three leaves at each node of the stem.

***Rumex crispus* L.**

Mr. Fuller sends specimens of a *Rumex* collected near Rochester, in a field locally known as the Riley lot. According to his notes and the characters exhibited by the specimens, the plants are from four to six feet high, which is nearly twice the height of the ordinary *R. crispus* growing in the same field. Its leaves are smoother and more fleshy, paler, less veiny and less crisped on the margin than those of the yellow dock which they otherwise resemble. Its panicles are paler and the fruit valves are larger and more rounded with commonly only one of them grain-bearing. They are entire or but slightly toothed on the margin. The plants begin to blossom four or five weeks earlier than *R. crispus*, but they ripen few or no seeds, nearly all the flowers being abortive and falling about the first week in July. This indicates that the plants are hybrids. A hybrid of *R. crispus* and *R. obtusifolius* is known and was reported by Professor Dudley in his Catalogue of Plants of Cayuga Valley, but the specimens from Rochester do not agree with the description given of that hybrid, and the tall growing plants and the broad rounded valves without conspicuous teeth on the margin and commonly only one grain-bearing indicate rather a hybrid between *R. crispus* and *R. Patientia*.

***Arceuthobium pusillum* Pk.**

This parasite on the spruce has been found by M. A. Baxter as far west as Rochester.

***Hicoria alba* (L.) Britton.**

The mocker nut, (*Carya tomentosa* Nutt.) is common enough on Long Island and in the southern part of the State, but in other parts it is either wholly absent or occasional in its occurrence. The local catalogues of plants do not record it in the western part of the State. It is credited to Oneida county on the authority of Knieskern and is mentioned as "scarce" in the Catalogue of Plants of Schenectady county. It occurs near Cedar Hill, Albany county, which is the most northern station in which I have seen it.

***Quercus macrocarpa* Mx.**

The form of this oak recognized by Michaux as a distinct species, and to which he gave the name *Quercus olivæformis*, is now generally

regarded by botanists as a mere form or at most a mere variety. It was admitted into the New York Flora by Dr. Torrey on the authority of Michaux. He gave as its locality, "banks of the Hudson above Albany and in the western part of the State." Since that time it has been reported from Glenville, Schenectady county, by Professor Pierson and from Dexter, Jefferson county, by Dr. Vasey. In August a single tree of it was discovered by myself near Mechanicville, Saratoga county. This discovery is more interesting because of the proximity of this tree to one of the localities mentioned by Michaux, and because of the possibility that this very tree may be a lineal descendant of one of the trees observed by him. Recently a specimen of the same variety has been sent to us by Dr. Vandenburg, who collected it near Fort Edward.

***Picea Canadensis* (Mill) B. S. P.**

The white spruce (*Picea alba* Lk. of the Manual) occurs in Minerva, Essex county. This is the most southern station in which I have seen it. Some of the old cones still remained on the tree in July, but the ground under the tree was well strewn with fallen cones and the attachment of those remaining on the tree was very slight and easily broken. The bark of this tree contains blisters or resin reservoirs similar to those of the balsam, *Abies balsamea*, but they are less prominent and less numerous. The resin in them is scarcely distinguishable in color, consistency or flavor from that of the balsam.

Besides the white spruce and the black spruce we have in the State a third form, which may be a variety of the black spruce. I have observed it in the swamps and on the mountains of the Adirondack region and elsewhere. It has the slender twigs, glabrate stigmata and small cones ascribed to *Picea rubra*, but I hesitate to report it as that species, because the cones have the persistency ascribed to those of the black spruce. The foliage generally has the silvery green hue of the foliage of the balsam. The leaves are generally shorter than those of the black spruce and are not more acute. The tree is of very slow growth and very flexible. The question in my mind is whether it should be considered a variety of the black spruce or a distinct species.

***Habenaria hyperborea* R. Br.**

The great variability of this species is recognized in the New York Flora, but no effort seems to have been made to classify the varieties. In the marshes and cedar swamps about Jordanville, three well marked forms occur.

In one the plants are two or three feet high, with a stem six to ten lines thick, with broad leaves and a dense spike of spreading flowers. This is the largest and stoutest form.

In another the plants are generally about a foot high, with a rather slender stem and narrow leaves, but with a dense spike of spreading flowers.

In the third form the plants are eight to twelve inches high, the stem slender, the leaves narrow and the spike loose and slender, with erect or appressed flowers.

***Corallorhiza multiflora* Nutt.**

A variety of this species has occurred in woods at Menands, Albany county, in which nearly the whole plant has a pale yellow color, the lip of the flower being white and unspotted. This is such a wide departure from the ordinary form that I have labeled our specimens *Corallorhiza multiflora flavida*.

***Cyperus esculentus* L.**

The yellow nut grass sometimes penetrates the tubers of the potato by its sharp pointed rootstocks and develops its tubers in the tubers of the host. Specimens of this kind were brought to me by Mr. Van DeLoo, of the State Museum. One of the invading tubers was planted and it developed into a fine specimen of *Cyperus esculentus*.

***Carex castanea* Wahl.**

This rare and interesting sedge still lingers in small quantity under the hemlocks on the eastern shore of Cedar lake, in the southern part of Herkimer county. Its first discovery in this country was made here by Professor Gray more than sixty years ago. At the time of my visit to this place men were busy cutting the hemlock trees and

peeling the bark from their trunks, and I fear very much that the changed conditions thus induced will soon cause the disappearance of these rare plants from this historic locality.

Carex Schweinitzii *Dew.*

More than thirty years ago Rev. J. A. Paine detected this rare sedge in the swamp near Cedarville. It still exists there, growing in the edge of the swamp in a springy place at the foot of a hill. It was found by myself in a similar locality near Pike, Wyoming county, in June.

Carex livida *Willd.*

In the Catalogue of Oneida county plants this sedge is reported as abundant on the State marsh in Litchfield, Herkimer county. A recent visit to this locality failed to reveal more than a few poorly developed specimens. The indications are that this rare species will soon disappear entirely from this locality.

Carex filiformis *L.*

This sedge sometimes assumes a sort of dioecious character. On one of the marshes in Litchfield, Herkimer county, some plants bore only staminate spikes; others bore only a single pistillate spike. But in the same locality other plants bore both staminate and pistillate spikes as usual.

Carex teretiuscula prairea *Britton.*

This is the prevailing form of the species in all the cold "cedar swamps" in the towns of Litchfield and Warren in the southern part of Herkimer county. The typical form of the species occurs in more open and less boggy places. Specimens collected in Albany county many years ago have the spikes on still longer branches, and thus appearing more conspicuously paniced. This is *Carex prairea* *Dew.* and *C. teretiuscula ramosa* *Boott.*

Festuca duriuscula *L.*

Wet, dripping cliffs along the Genesee river at Portage. The specimens were collected near the high bridge of the N. Y. & L. E. Railroad, on the west side of the river. The culms are rather slender,

often geniculate at the base and about two feet tall. The lower sheaths are hairy or downy, and the upper surface of the cauline leaves are minutely hairy along the veins. The basal leaves are involute and eight to ten inches long. The habitat is so peculiar that I suspect the plants are indigenous in this locality. They certainly seem to me to be specifically distinct from *Festuca ovina*, to which, in the Manual, this species is added as a variety. The plants have no running rootstocks.

Elymus striatus Willd.

Dry rocky woods. Menands and Cedar Hill, Albany county. July. Our plants belong to the variety *villosus* Gray, *Elymus villosus* Muhl. of the New York Flora.

Tricholoma terreum fragrans Pk.

Poughkeepsie. October. *H. W. Barratt*. Mr. Barratt writes that many hundred specimens of this mushroom grew in a patch about twenty feet square, yet not as many as in the fall of 1894. There were none in 1895. He regards it as a valuable mushroom on account of its late appearing, its freedom from insect attack, its durability and fine flavor. It is especially good roasted and eaten on dry buttered toast or on milk toast. In his opinion many mushrooms are better roasted than cooked in other ways.

Clitocybe vilescens Pk.

A pale form of this species grows on sandy soil, in which the pileus is smoky white, but it becomes grayish-brown in drying. The mycelium binds together a mass of sand, so that when the plant is taken up carefully a little ball of sandy soil adheres to the base of the stem. The stem is sometimes pruinose. The flavor is mild and agreeable.

Clitocybe amethystina Bolt.

This fungus has commonly been united with *C. laccata* as a variety, though sometimes the remark is added that perhaps it is a distinct species. So far as I have observed it, its colors constitute the chief difference between the two, but these are very constant. I have seen no connecting forms. *C. laccata* has been made the type of a new

genus *Laccaria* by Berkeley and Broome, with the following characters: Pileus convex then umbilicate or depressed, flesh thin; lamellæ broadly adnate, sometimes with a decurrent tooth, becoming mealy with the copious subglobose minutely warted white spores; stem central, externally fibrous; veil not evident.

If this genus is accepted, *Clitocybe ochropurpurea* Berk. and *C. tortilis* Bolt. should be referred to it. *C. trullisatus* Ellis is closely allied to these in general characters and appearance, but must be excluded because its spores are oblong and smooth.

Then admitting the specific validity of *C. amethystina*, we have four species that should be included in it. The species may be recognized by the characters indicated in the subjoined table.

Stem more than 4 lines thick.....	<i>L. ochropurpurea</i> .
Stem less than 4 lines thick	1
1 Moist pileus obscurely violaceous or watery brown, lamellæ amethystine.....	<i>L. amethystina</i> .
1 Moist pileus rufescent tinged with yellow or flesh color, lamellæ flesh color	2
2 Stem commonly longer than the width of the pileus, 1 to 4 in. long.....	<i>L. laccata</i> .
2 Stem commonly shorter than the width of the pileus, 4 to 10 lines long.....	<i>L. tortilis</i> .

Pholiota unicolor Vahl.

Specimens of this species were found near Jordanville as early as June. They were growing on moss-covered decaying wood. The resemblance between this species and some forms of *Clitocybe laccata* is quite strong. The color of its spores and the presence of a membranous annulus will at once preclude any confusion of the two species. The stem sometimes has a very evident white mycelioid tomentum at its base.

Pholiota angustipes Pk.

This plant is of rare occurrence. It was discovered in 1876. The past season it was found in Albany county. The pileus varies in color from brown to gray or grayish-brown. It is slightly viscid when moist. The veil is slight and often its fragments adhere entirely to

the margin of the pileus, leaving the stem without an annulus. Were it not for the rusty tint to the spores such specimens might easily be referred to the genus *Hypholoma*.

***Lactarius aquifluus* Pk.**

This plant is sometimes *cæspitose*. The pileus when dry is tawny-gray and squamulose or rimulose-squamulose. The margin may be even or coarsely sulcate-striate. The flesh is grayish or reddish-gray. The color of the lamellæ varies from creamy-white to tawny-yellow. The stem often has a conspicuous white mycelioid tomentum at its base. I have never found this plant with a white or milky juice, and therefore I am disposed to regard it not as a variety of *L. helvus*, but as a distinct species. Its mild taste and agreeable odor suggested a trial of its edible qualities. It is harmless, but the lack of flavor induces me to omit it from the list of edible species.

***Galera tenera* Schæff.**

A notable form of this species was found growing in an old stable of an abandoned lumber camp. The plants were large, the pileus in some being more than an inch broad, the stems were three to six inches long and the color was ferruginous as in *G. ovalis*, to which the plants might be referred but for the large spores. Essex county. July. I have labeled the specimens variety *obscurior*.

***Cortinarius violaceus* Fr.**

Minerva, Essex county. A form of this species occurs here, having the pileus merely downy or punctate-hairy under a lens, no squamules being distinguishable by the naked eye. July.

***Panæolus retirugis elongatus* n. var.**

Pileus grayish-brown, 1 to 1.5 in. broad; stem straight, 5 to 7 in. long.

Growing with *Galera tenera obscurior* in an old stable of an abandoned lumber camp, near Minerva, Essex county. July.

The stems were often coated toward the base with a grayish-white tomentum.

***Coprinus plicatilis* Fr.**

Chip dirt, about an old lumber camp, Township 24, Franklin county. September.

The lamellæ sometimes show a whitish edge and whitish dots on the sides. These are due to projecting cells of cystida. There is a sterile form in which the pileus is paler than in the fertile form, and the lamellæ are persistently whitish. The lamellæ are free and sometimes the free space about the stem ruptures in such a way as to give them the appearance of being attached to a free collar. The spores are broadly ovate and compressed, so that the transverse diameter is greater when the spore lies flat than when it lies on its edge. They are .00045 to .0005 in. long, .0003 to .0004 broad.

***Cantharellus aurantiacus pallidus* Pk.**

Specimens of this variety were found growing from the dead trunk of a standing pine tree. The stem in some instances was eccentric. The yellowish pileus sometimes has the margin almost white. The lamellæ are frequently crisped or wavy.

***Cantharellus cinereus bicolor* n. var.**

Pileus and stem pale cinereous or grayish; hymenium yellowish, its folds very narrow. Menands. August.

***Lenzites betulina rufozonata* n. var.**

Pileus brown, grayish-brown or tawny-brown, with one or more reddish subglabrous zones. Ulster and Saratoga counties. September and October.

***Russula Mariæ* Pk.**

This fungus appeared in considerable abundance the past summer near Albany and at Port Jefferson. It is well marked by the pruinose appearance of its pileus and the minute reddish or purplish granules which when wet cause a stain upon any white surface or paper which may lie in contact with the pileus. The margin is even, but sometimes becomes slightly striate in old age. The flesh is white, but is often slightly red or pinkish under the cuticle, which is separable, at least on the margin. The lamellæ are entire and the inter-

spaces venose. The stem is sometimes white, but generally it is colored like the pileus or a little paler. There are several species which have the pileus similarly colored, among which are *R. purpurea* Gill., *R. Queletii* Gill., *R. expallens* Gill. and *R. drimeia* Cke., but from all these, which are acrid, it is distinct by its mild taste. Sometimes the margin of the pileus fades with age and then the appearance is very similar to that of *R. depallens* Fr. as shown by the figures in Illust. of British Fungi, plate 1021. But that species has a viscid pileus and the stem varies from white to cinereous. It has not the red or purplish hues of the stem of our plant.

***Hydnum albidum* Pk.**

Port Jefferson. July. This fungus has been tested and found to be edible.

***Hydnum Caput-ursi* Fr.**

This species is not rare in the Adirondack forests. It grows on old trunks of deciduous trees either prostrate or standing and sometimes attains a large size, being six or eight inches high and nearly as broad, with aculei an inch long. Small forms have shorter teeth and might easily be mistaken for *H. coralloides* if not carefully observed. I have eaten of it and find it very good, but scarcely as well-flavored as *H. coralloides*.

***Thelephora laciniata* Pers.**

A form of this species in which the margin of the pileus is entire is not rare. To distinguish it from the typical form it might be called variety *integra*.

***Stereum spadiceum plicatum* n. var.**

Pileus narrow, laterally confluent, much crisped or folded. Prostrate trunks of oak, *Quercus alba*. Menands. August.

***Anthurus borealis* Burt.**

In an asparagus bed. Sherruck, Delaware county. August. F. B. Southwick.

This is the second time and the second locality in our State in which this very rare and interesting phalloid fungus has been found. Successive crops of it appeared in this place during an interval of several weeks.

Xylaria digitata (L.) Grev.

Prostrate trunks of maple, *Acer saccharinum*. Adirondack mountains. September.

This species is quite variable. Specimens growing in the same group and under the same conditions had the stroma terete or compressed, simple or divided above into two or more branches, or two or more would be united at the base only as if growing from a single starting point. Occasionally two clubs are confluent or grown together throughout their entire length. The apex may be either rather bluntly acute or acuminate and sterile, but sometimes it is obtuse. The stem may be either short or long and wholly glabrous or at the very base involved in mucedinous tomentum. The clubs in our specimens were very fragile when fresh.

Var. *tenuis* n. var. Clubs slender, 1 to 1.5 lines thick, with the sterile apex commonly more conspicuous; perithecia less crowded and more prominent; stem elongated, commonly flexuous.

This variety was found growing on the same trunk with the ordinary form but lower down on the sides and partly beneath, and probably depends chiefly on its place of growth for its peculiar development. The spores both in it and in the typical form are .0007 to .0009 in. long.

Var. *Americana* differs chiefly in its shorter spores, which are about .0005 in. long. This is our most common form and the dimensions of its spores are given in the work on North American Pyrenomyces as representing the spores of the species in this country. It may be a question whether this fungus would better be considered a variety of *X. digitata* or a distinct species.

(E.)

NEW YORK SPECIES OF FLAMMULA.

Flammula Fr.

Pileus fleshy, its margin at first involute; lamellæ decurrent or adnate without a sinus; stem fleshy-fibrous, not mealy on the upper part; veil fibrillose or none.

The genus *Flammula* is not represented in our territory by a large number of species. It is, nevertheless, not very sharply distinct from

the allied genera, *Pholiota*, *Hebeloma* and *Naucoria*. From *Pholiota* it is especially separated by the slight development of the veil which is merely fibrillose or entirely wanting. It never forms a persistent membranous collar on the stem. From *Hebeloma* it may be distinguished by the absence of a sinus at or near the inner extremity of the lamellæ, by the absence of white particles or mealiness from the upper part of the stem and by the brighter or more distinctly ferruginous or ochraceous color of the spores. From *Naucoria* the fleshy or fibrously fleshy stem affords the most available distinguishing character. The genus belongs to the *Ochrosporæ* or ochraceous spored Series, but the spores of its species vary in color from ochraceous or tawny-ochraceous to ferruginous or fuscous-ferruginous. The three things to be especially kept in mind in order to recognize the species are the color of the spores, the adnate or decurrent but not clearly sinuate lamellæ and the fleshy or fibrously fleshy stem without a membranous annulus.

Our species are mostly of medium size, none being very small and one only meriting the appellation large. They appear chiefly in late summer or in autumn and grow in woods or in wooded regions either on the ground or more often on decaying wood. Many are gregarious or cæspitose in their mode of growth. Some have a bitterish or unpleasant flavor and none of our species has yet been classed as edible. Fries arranged the species in five groups, of which the names and more prominent characters are here given:

Gymnotæ. Pileus dry, often squamulose; veil none; spores ferruginous.

Lubricæ. Pileus viscose, glabrous, the pellicle subseparable; veil fibrillose; spores ferruginous or fuscous-ferruginous.

Udæ. Pileus moist or slightly viscid in rainy weather, glabrous, the cuticle not separable; veil evident, appendiculate.

Sapineæ. Pileus not viscose; lamellæ at first yellow or yellowish; veil almost none or fibrillose, not appendiculate; spores tawny or ochraceous.

Sericellæ. Pileus dry or at first viscid, slightly silky.

At present, no representatives of the first and the last tribes are known to belong to our State. The three remaining tribes are repre-

sented by twelve species, but three of these are so closely allied respectively to three others that they might easily be regarded as mere varieties rather than as distinct species. An analytical table is here given to facilitate the tracing of the species to their respective names:

Pileus viscose, the cuticle separable	1
Pileus moist, glabrous, cuticle not separable.....	6
Pileus dry.....	9
1 Pileus commonly obscurely spotted, stem solid.....	2
1 Pileus not spotted; stem stuffed or hollow	3
2 Pileus paler on the margin, flesh white.....	lubrica.
2 Pileus uniformly colored, flesh grayish-white.....	subfulva.
3 Stem fibrillose.....	4
3 Stem squamulose or floccose-squamulose.....	5
4 Pileus paler on the margin, flesh yellowish.....	spumosa.
4 Pileus uniformly colored, flesh whitish.....	squalida.
5 Pileus 1 inch or more broad, flesh yellow.....	carbonaria.
5 Pileus 1 inch or less broad, flesh whitish.....	Highlandensis.
6 Pileus not hygrophanous.....	7
6 Pileus hygrophanous.....	8
7 Pileus yellow, slightly silky on the margin.....	alnicola.
7 Pileus pale yellow, margin naked.....	flavida
8 Stem reddish-brown.....	Halliana.
8 Stem not reddish-brown.....	rigida.
9 Pileus buff, fibrillose-virgate.....	magna.
9 Pileus golden-tawny, flocculose-squamulose.....	sapinea.

Lubricæ.

Pileus covered with a viscose glabrous wholly or partly separable cuticle; veil fibrillose; spores ferruginous or fuscous-ferruginous.

Flammula lubrica Fr.

SLIMY FLAMMULA.

Hym. Europ. p. 246. Syl. Fung. Vol. V. p. 815.

Pileus fleshy, somewhat tough, convex becoming plane or sometimes slightly depressed, even, viscose, often adorned with a few inconspicuous appressed spot-like scales, yellowish-red or tawny with a paler or yellowish margin, flesh white; lamellæ close, adnate or slightly decurrent, at first pallid or dingy clay color becoming sub-ferruginous; stem equal or slightly tapering upward, solid, fibrillose

or somewhat flocculose-squamulose below, often striate at the top, whitish with a white mycelioid tomentum at the base; spores dark ferruginous, .00024 in. long, .00016 broad.

Pileus 1.5 to 3 in. broad; stem 1.5 to 4 in. long, 2 to 5 lines thick.

Decaying wood and ground among fallen leaves. Catskill and Adirondack mountains.

Sometimes the pileus is slightly umbonate and its margin appendiculate with the remains of the white floccose-fibrillose veil. The spots are due to the presence of more highly colored innate fibrils. The stem is often flexuous. It sometimes becomes a little brownish or ferruginous toward the base when old. The Adirondack specimens were found growing on decaying spruce wood.

***Flammula subfulva* Pk.**

DINGY-TAWNY FLAMMULA.

Mus. Rep. 41, p. 68.

Pileus convex, viscid, innately fibrillose, spotted toward the margin with darker colored appressed scales, sordid-tawny, flesh grayish-white; lamellæ close, adnate, becoming ferruginous; stem equal or slightly tapering upward, fibrillose, solid, whitish; spores brownish-ferruginous, elliptical, uninucleate, .00024 to .0003 in. long, .00016 broad.

Pileus 1.5 to 2.5 in. broad; stem 2 to 3 in. long, 2 to 4 lines thick.

About the base of trees. Catskill mountains. September.

The plant is more or less cæspitose in its mode of growth. It has been found but once. It is so closely allied to the preceding species that it might easily be regarded as a mere variety of it. The differences are found chiefly in the uniformly colored pileus and its grayish-white flesh.

***Flammula spumosa* Fr.**

FROTHY FLAMMULA.

Hym. Europ. p. 247. Syl. Fung. Vol. v. p. 817.

Pileus fleshy, thin, convex or nearly plane, obtuse or umbonate, glabrous, viscose, pale yellow, tinged with reddish tawny or brownish hues in the center, flesh pale yellow or greenish-yellow; lamellæ thin, close, adnate, pale yellow when young, becoming ferruginous;

stem rather slender, equal or tapering at the base, fibrillose, hollow, yellowish, generally becoming brownish or ferruginous toward the base; spores elliptical, dark ferruginous, .0003 in. long, .00016 to .0002 broad.

Pileus 1 to 2 in. broad; stem 1.5 to 3 in. long, about 2 lines thick.

Gregarious or cæspitose; growing on the ground or on decaying wood. August and September.

This is our most common species of *Flammula*. It is found especially in hilly or mountainous districts, either in woods or open places. The pileus varies in the color of its center or disk from reddish to brownish. The umbo is sometimes present and very distinct, but it is often wholly absent. Occasionally the pileus becomes depressed in the center and then its margin is apt to be irregular, repand or wavy. It is a beautiful fungus when clean and well developed. Specimens, which in Report 23, p. 91, were referred to *Agaricus polychrous*, are probably only a form of this species. Satisfactory specimens of *Ag. polychrous* have not yet been found in our State.

***Flammula squalida* Pk.**

SQUALID FLAMMULA.

Mus. Rep. 44, p. 19, auct. ed.

Pileus fleshy, convex or plane, firm, viscose, glabrous, dingy-yellowish or rufescent, flesh whitish but colored similar to the pileus under the separable cuticle; lamellæ rather broad, adnate, pallid, becoming dark ferruginous; stem slender, generally flexuose, hollow, fibrillose, pallid or brownish, pale yellow at the top when young; spores brownish-ferruginous, .0003 in. long, .00016 broad.

Pileus 1 to 1.5 in. broad; stem 1.5 to 3 in. long, 1 to 2 lines thick.

In bushy and swampy places. Cattaraugus and Rensselaer counties. September.

This species is closely related to *F. spumosa*, of which, perhaps, some may prefer to consider it a variety. But having observed it several times in different localities and always finding it constant in its characters and readily distinguishable, it has seemed best to recognize it as a distinct species. Its dingy appearance, slender habit,

more uniform and darker color of the pileus and darker color of the mature lamellæ and spores are its peculiar features. It is often very cæspitose and is found especially among alder bushes in swamps.

***Flammula carbonaria* Fr.**

BURNT GROUND FLAMMULA.

Hym. Europ. p. 247. Syl. Fung. Vol. v. p. 817.

Pileus fleshy, thin, convex or nearly plane, even, glabrous, viscid, subtawny, flesh yellow; lamellæ broad, adnate, crowded, brownish-clay color; stem equal or tapering downward, slender, rigid, narrowly fistulose, fibrillose-squamulose, pallid; spores brownish-ferruginous, .0003 to .0004 in. long, .00016 to .0002 broad.

Pileus 1 to 2 in. broad; stem 1 to 2 in. long, 2 to 3 lines thick.

Burnt ground and charcoal beds. Rensselaer county. June. Rare.

European authors do not agree as to the dimensions of the spores of this species. In Sylloge they are given as 10 to 11 x 5 to 6. In British Fungus Flora, as 7 x 3.5. Fries describes the pileus as one inch or a little more in width, but Cooke represents it as much broader, sometimes reaching three inches in diameter. The only specimens we have ever seen that agree tolerably well with the description of the European plant were found growing on ground where wood had been burned into charcoal a short time before.

***Flammula Highlandensis* Pk.**

HIGHLAND FLAMMULA,

Agaricus Highlandensis, Mus. Rep. 24, p. 67.

Pileus fleshy, thin, hemispherical or convex, becoming nearly plane, glabrous, viscid, yellowish-red, commonly paler or yellowish on the inflexed margin, flesh white or whitish, sometimes tinged with yellow under the tough separable cuticle; lamellæ close, rounded behind or adnate, sometimes with a decurrent tooth, pallid or yellowish when young, becoming ferruginous; stem equal, stuffed or hollow, fibrillose and minutely floccose-squamulose, yellowish; spores elliptical, .00024 to .0003 in. long, .00016 broad.

Pileus 6 to 12 lines broad; stem 1 to 1.5 in. long, 1 to 2 lines thick.

Burnt ground or damp earth. Highlands of Orange county, Catskill mountains and Adirondack mountains. June to September.

From *F. carbonaria*, of which it may perhaps be a mere variety, this is separated by its smaller size, whitish flesh and differently colored lamellæ. The margin of the pileus is often paler than the central part. The surface is usually more or less defiled by dirt or other adhering substances that have been carried up in the growth of the plant. The mycelium commonly binds together a little ball of earth which clings to the bottom of the stem when the plant is pulled from the ground. *Agaricus Ascophorus* is merely a form of this species with the squamules of the stem wanting or inconspicuous.

Udæ.

Pileus moist or slightly viscid in rainy weather, glabrous, the cuticle not separable; veil evident, appendiculate.

Flammula alnicola Fr.

ALDER FLAMMULA.

Hym. Europ. p. 248. Syl. Fung. Vol. v. p. 820.

Pileus fleshy, at first broadly conical or convex, then broadly convex or nearly plane, glabrous or sometimes slightly silky-fibrillose on the margin, clear lemon yellow, rarely tinged with ferruginous in the center, moist, flesh yellowish, taste bitter; lamellæ close, adnate or sometimes slightly rounded behind, pallid or yellowish becoming ferruginous; stem rather long, often curved or flexuose, fibrillose, hollow, yellowish becoming ferruginous or brownish-ferruginous especially toward the base; spores ferruginous, .0003 to .0004 in. long, .0002 to .00024 broad.

Gregarious or cæspitose; pileus 1 to 2.5 in. broad; stem 2 to 3 in. long, 2 to 4 lines thick.

Ground or decaying wood of deciduous trees. Albany and Rensselaer counties, Catskill and Adirondack mountains. September and October.

The Alder flammula is a beautiful fungus. The color of the pileus is generally a uniform bright lemon yellow but sometimes it assumes

deeper hues and may be tinged with ferruginous in the center. The margin is generally adorned with pale yellow or whitish webby fibrils which are sometimes slightly interwoven. Usually they are appendiculate to the margin of the expanded pileus, but occasionally they adhere in part to the stem and form a kind of evanescent annulus. The lamellæ vary at their inner extremity, being either rounded behind, adnate or slightly decurrent. The plants do not inhabit alders alone as might be inferred from the specific name, but they also occur on birch and wood of other deciduous trees and on the ground.

Flammula flavida Pers.

PALE YELLOW FLAMMULA.

Hym. Europ. 248. Syl. Fung. Vol. v. p. 820.

Pileus fleshy, thin, broadly convex or nearly plane, glabrous, moist, pale yellow, flesh whitish or pale yellow, taste bitter; lamellæ moderately close, adnate, pale or yellowish becoming ferruginous; stem equal, often more or less curved, hollow, fibrillose, whitish or pale yellow, with a white mycelium at the base; spores .0003 in. long, .0002 broad.

Pileus 1 to 2 in. broad; stem 1 to 3 in. long, 1 to 3 lines thick.

Decaying wood of various trees. Commonly in wooded or mountainous districts. Summer and autumn.

Our specimens were found on wood of both coniferous and deciduous trees. The plants are sometimes cæspitose. The pileus becomes more highly colored in drying. The spores are pale ferruginous approaching ochraceous. In Sylloge the spores of this species are described as pale yellowish.

Flammula Halliana Pk.

HALL'S FLAMMULA.

Mus. Rep. 23, p. 90.

Pileus thin, hemispherical or convex, glabrous, hygrophanous, subferruginous with the margin obscurely striatulate when moist, dull yellow when dry; lamellæ close, subarcuate, slightly decurrent, tapering to a point at the outer extremity and ceasing before reaching

the margin, ferruginous; stem equal, slightly fibrillose, hollow, reddish-brown; spores ferruginous, .0003 to .0004 in. long, .0002 to .00024 broad.

Pileus 1 to 2 in. broad; stem 2 to 3 in. long, 2 to 3 lines thick.

Pastures. Albany county. November.

This plant was found more than twenty-five years ago and has not since been detected. Its flavor is bitterish. The fibrils of the veil form a slight fibrillose annulus on the stem which forms a lodging-place for the spores and becomes stained by them.

***Flammula rigida* Pk.**

RIGID FLAMMULA.

Mus. Rep. 50, p. 104.

Pileus thin, rather firm and rigid, convex becoming nearly plane or centrally depressed, sometimes wavy on the margin, glabrous, hygrophanous, rusty-tawny or subferruginous when moist, buff or grayish-buff when dry, flesh concolorous; lamellæ moderately close, adnate, creamy-white becoming rusty tan color or subferruginous; stem equal or nearly so, tough, slightly striate, colored like the pileus, with a compact white tomentum on the lower part or at the base; spores broadly elliptical, .0003 to .00035 in. long, .00016 to .0002 broad.

Pileus 1 to 1.5 in. broad; stem 1 to 2 in. long, 1.5 to 3 lines thick.

Chip dirt. Adirondack mountains. September.

The plants are gregarious and by the mycelium they adhere closely to chips and fragments of wood from which they grow and which are usually pulled up with them when they are gathered. This is a smaller plant than the preceding one and has the dry pileus and shorter stem paler in color.

Sapineæ.

Pileus not viscose; lamellæ at first yellow or yellowish; veil almost none or fibrillose, not appendiculate; spores tawny or ochraceous.

The species of this tribe grow especially on decaying wood of pine and other coniferous trees or on the ground about or under them.

Flammula sapinea* Fr.*PINE TREE FLAMMULA.**

Hym. Europ. p. 251. Syl. Fung. Vol. v. p. 824.

Pileus fleshy, compact, hemispherical or convex, becoming expanded, sometimes irregular, obtuse, dry, slightly flocculose-squamulose when young, often becoming rimose and paler with age, golden-tawny, paler and shining on the margin, flesh yellowish, odor strong; lamellæ broad, close, adnate, yellow becoming tawny-cinnamon; stem commonly short, often unequal or irregular, compressed and sulcate, sometimes radicating, stuffed or hollow, yellowish or pallid; spores ochraceous, .0003 in. long, .0002 broad.

Pileus 1 to 3 in. broad; stem 1 to 2 in. long, 3 to 5 lines thick.

Decaying wood of pine. Onondaga county. September.

This is a rare species in our State. The plants are sometimes cæspitose.

Flammula magna* Pk.*LARGE FLAMMULA.**

Mus. Rep. 50, p. 103.

Pileus fleshy, broadly convex, soft, dry, fibrillose and somewhat virgate, pale yellow or buff, the margin commonly becoming revolute with age, flesh whitish or yellowish; lamellæ close, adnate or slightly decurrent, often crisped or wavy toward the stem, about three lines wide, ochraceous; stem equal or thickened toward the base, fleshy-fibrous, solid, elastic, fibrillose, colored like the pileus, brighter yellow within; spores subelliptical, ochraceous, .0004 in. long, .00024 broad.

Cæspitose; pileus 4 to 6 in. broad; stem 3 to 4 in. long, 8 to 12 lines thick.

About the base of trees. Westchester county. October.

This is a large and showy species. The stems are sometimes united at the base into a solid mass. The young lamellæ are probably yellow, but I have seen only mature specimens.

(F.)

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REPORT.

OFFICE OF THE STATE ENTOMOLOGIST, }
ALBANY, *December 14, 1896.* }

To the Regents of the University of the State of New York:

GENTLEMEN.—I have the honor of presenting to your Board my Twelfth Report on the Injurious and Other Insects of the State of New York.

The work of the department has been diligently and successfully prosecuted during the year. A large number of insects have been studied, most of which are of economic importance to the farmer, the fruit-grower, or to the general public. Among these special attention was given to the army-worm in consideration of its distribution and destructiveness throughout the larger portion of the State of New York to an extent not previously recorded. In the pages devoted to the elm-leaf beetle will be found interesting observations upon the long continuance, in successive broods, of the insect in this vicinity—quite at variance with what has hitherto been ascribed to it. Instead of the beetle going into retreat for hibernation in the month of August, the insect has remained with us from its first appearance in May until into November as active larvæ and transforming in its subsequent stages. Quite a number of the insect attacks that have come under observation, have been noticed briefly in “Notes on Some of the Insects of the Year in the State of New York,” and others, more fully, in their proper place in the body of the report.

Work upon the classification, arrangement, and labeling of the Collection has been continued. Some progress has been made in the preparation of a biological collection in the limited time that could be spared

for the purpose: A well-arranged collection of this character, exhibiting at a glance the entire life-history, habits, transformations, enemies, etc., of each species, would prove both interesting and instructive to those who apply in person at our rooms for information regarding some special insect pest. The material for such an exhibit has been accumulating during past years, and is only awaiting time for its arrangement.

The additions made to the State Collection have not been as large as those of the preceding year, from the general paucity of insect life, as noticed in a following page. Their number (in part estimated) aggregates about 2,000. Contributions have been received from forty-two persons aggregating about eight hundred examples.

The Tenth Report of the State Entomologist was issued in the early part of July, and forms a part of the Forty-eighth Report of the State Museum. An edition was also printed as separates, for convenience of distribution among agriculturists and entomologists. The report contains 300 pages, 4 plates and 24 figures. Its preparation required an unusual amount of office labor from the extended index given to the ten reports of the Entomologist (1883-1895), occupying 93 pages, and embracing (as estimated) 20,600 references.

The Eleventh Report of the State Entomologist for the year 1895, is now being printed, and will, it is hoped, be ready for distribution before the close of the present year. It will contain nearly 250 pages and 16 plates.

The usual list of miscellaneous publications by the Entomologist during the current year will be found in the Appendix. Forty-one titles are cited with time and place of publication, with a brief summary of each. The aggregate number of such publications listed and abstracts given, in the several volumes of this series of reports, including the present, is 909.

The correspondence of the office during the year has been as follows: Letters received and filed, 1119; letters sent, so far as recorded, 1215.

Arrangement has been made for an amount of additional shelving required by the increase in the collections and library. These additions

will permit a better classification of material, and add greatly to convenience in the frequent reference to both specimens and publications.

In conclusion, I desire to express my appreciation of the aid and encouragement extended by your board during the year past, especially in the recent arrangement through which my department has been brought in closer and more satisfactory relations with your Honorable Board.

Respectfully submitted,

J. A. LINTNER.

INJURIOUS INSECTS.

"Camponotus Pennsylvanicus" and "Formica rufa."

Carpenter Ant and Mound-building Ant.

(Ord. HYMENOPTERA: Fam. FORMICIDÆ.)

In the preceding Report of this series (Eleventh), one of the large ants, *Camponotus herculeanus* var. *Pennsylvanicus*, is represented as sometimes entering dwellings from nests built outside near the house. In one instance mentioned by Dr. Riley, a fine old homestead was so overrun with it that it was on the point of being sold, when the source of the infestation was discovered in a large nest of several feet in diameter in the back yard.

In all probability the above infestation as cited by Dr. Riley was erroneously referred to *C. herculeanus*. Rev. Dr. H. C. McCook, of Philadelphia, who has made special study of the habits of our N. American ants, has modestly questioned the statement in a recent letter received from him:—

"I think that I may venture to question the statement respecting *Camponotus Pennsylvanicus* on page 113. I am reasonably familiar with the habits of this species, and have never known an example of a nest made in the earth, as implied in your statement. It is a carpenter ant exclusively, and lives in trees and timber. I suspect, therefore, that a mistake must have been made in the species. I have occasionally seen the Pennsylvania carpenter ant in houses, but as a rule, it is not inclined to such resorts, and I very much doubt if it could have proved a household pest.

"I make the above statement with some degree of confidence, even though you quote Dr. Riley for your authority. However, if Mr. Theodore Pergande endorses the species, I suppose I should waive my objection, as he is well acquainted with the species of our American Ants."

Dr. McCook has also indicated another error made by me, on page 115 of the Report cited, where *Formica rufa* is given as the "not improbable" annoying occupant of the soil of a lawn on the south side of Long Island, which "during the summer is alive with ants," and also the artificers of large mounds seen by me in the Catskills and in the Shawangunk range at Lake Mohonk. He writes as follows:

"You refer to our American mound-making ants as *Formica rufa*. That is a blunder which I made when I first published an account of the habits of these species in the Transactions of the American Entomological

Society, of 1877. I was misled by Mr. Smith, of the British Museum. Dr. August Forel, however, subsequently corrected my error and described this species as a new one, viz., *Formica exsectoides*. We have *F. rufa* in this country. I have observed and studied it in Colorado, and know that it is found in the Dakotas, but I have no knowledge of its being found in the New England States or in Eastern New York."

In consideration of Dr. McCook's expressed deference to Mr. Pergande's views, his letter was submitted to Dr. Howard, chief of the Entomological Bureau at Washington, who returned the following comments by Mr. Pergande:

"Regarding our mound-making ants I will say that the genuine *Formica rufa* has so far not been found in this country, but that there are numerous forms more or less nearly related to it which occur in different sections of the United States. One of these forms, *F. exsectoides* Forel, appears to be an exclusively eastern species and has so far been found only in Virginia, Pennsylvania, New Jersey and New York, whereas the most common form, occurring in Colorado, Utah, Montana, Wyoming, the Dakotas and Nebraska, is not *F. exsectoides*, as stated by Dr. McCook, but *F. obscuripes* Forel, which up to the present time has not been observed east of the Missouri and Mississippi. As to *Camponotus Pennsylvanicus*, I have never observed it to build extensive nests in the ground, either near dwellings or in the woods, although occasionally I have found small nests under stones near the base of large oak trees which were probably connected with breeding chambers in the large and partly decayed roots of the trees. Most commonly I found them in dead trunks or stumps, generally oak, which had been perforated in all directions by wood-boring larvæ. Whether the ants which Professor Riley observed as having built a large nest in the ground of a backyard in this city really were *C. Pennsylvanicus* or not, I am unable to say. I incline, however, to the belief that they were *Formica subsericea* Say, which has the habit of building large and rather flat nests in the ground."

In the recent "Comstock's Manual for the Study of Insects," *Formica exsectoides* is briefly referred to as being the builder of our largest ant-hills; these are often five or six feet across, and sometimes more than twice that in diameter. The head and thorax of this ant are rust-red, while the legs and abdomen are blackish brown. This species has been supposed to be the same as the European wood ant, *Formica rufa*, and is referred to in many books under that name.

Ecpantheria scribonia* (Stoll).The Great White Leopard-Moth.*

(Ord. LEPIDOPTERA: Fam. ARCTIIDÆ.)

- STOLL: Sup. to Cramer's Pap. Ex., 1787, fig. 177, pl. 41, fig. 3 (as *Phalæna*).
- ABBOTT-SMITH: Lepidopt. Ins. Georgia, 1797, p. 137, pl. 69 (as *Phalæna oculatissima*).
- CLEMENS: in Proc. Acad. Nat. Sci. Phila., xii, 1860, p. 523 (description, distribution).
- MORRIS: Cat. Lepidopt. North Amer., 1860, p. 25; Synop. Lepidopt. North Amer. 1862, p. 347 (synonymy, adult and larva described).
- HARRIS: Ins. Inj. Veg., 1862, p. 349 (moth and larva described).
- SAUNDERS: in Proc. Entomolog. Soc. Phila., ii, 1863, pp. 28-29 (larva described); the same in Canad. Journ., New Ser., viii, 1863, p. 370; Synop. Canad. Arctiidæ, 1863, p. 22; in Canad. Entomol., xiv, 1882, pp. 113-115, figs. 12, 13 (brief general account); in 13th Rept. Entomolog. Soc. Ont. for 1882, 1883, pp. 14-15, figs. 4, 5 (brief general account).
- PACKARD: in Proc. Entomolog. Soc. Phila., iii, 1864, p. 127 (bibliography, synonymy, distribution).
- RILEY: in Amer. Entomol.-Bot., ii, 1870, p. 179 (larva briefly described), p. 182 (known as "fever worm"); 4th Rept. Ins. Mo., 1872, pp. 141-143, figs. 63, 64 (life-history, description of larva); in Amer. Entomol., iii, 1880, pp. 133-134 (notes on life-history, parasites); Bull. 31 Divis. Entomol., U. S. Dept. Agric., 1893, p. 49 (eating leaves of cotton plant).
- STRETCH: Zyg. and Bomb., 1873, p. 174, pl. 7, figs. 20, 21.
- SIEWERS: in Canad. Entomol., ix, 1877, p. 128 (feeds on poke berry, will eat cabbage).
- FRENCH: in 7th Rept. Ins. Ill., 1878, p. 184 (brief account).
- MARTEN: in 10th Rept. Ins. Ill., 1881, p. 116 (brief mention).
- SLOSSON: in Entomolog. Amer., iii, 1887, pp. 185, 212 (variety *denudata* in Florida).
- EDWARDS, H.: Bull. U. S. Nat. Mus., No. 35, 1889, p. 61 (references).
- HARRINGTON: in 20th Rept. Entomolog. Soc. Ont., for 1889, 1890, p. 48, fig. 23 (brief mention).
- RILEY-HOWARD: in Insect Life, iii, 1890, p. 155 (*Ophion arctue* Ashm. parasitic on).
- SMITH: Cat. Ins. N. J., 1890, p. 294 (not rare); in Canad. Entomol., xxii, 1890, p. 179 (bibliography, synonymy); List Lepidopt. Bor. Amer., 1891, p. 27, no. 1122 (listed, synonymy).
- DYAR: in Psyche, vi, 1891, p. 127 (at Poughkeepsie, N. Y.); in Canad. Entomol., xxiii, 1891, pp. 106-108 (description of stages).
- HOWARD: in Bull. 33 Office Exp. Stat., U. S. Dept. Agric., 1896, p. 345 (feeding on cotton leaves); the same in Farm. Bull. 47, U. S. Dept. Agric., 1897, p. 26.

Although this handsome insect is native to the State of New York, the moth is rarely seen. The thickly-haired caterpillars of this and allied species are frequently seen in the autumn crawling rapidly, as though in haste to find suitable shelter for the winter before the setting in of cold weather. This particular species can not be considered injurious in this latitude, as it is comparatively rare, but in some of the southern States it is quite abundant, though not destructive.

The Egg.

Eggs of a moth sent me October 6, 1884, by Mrs. J. P. Ballard, of eastern Pennsylvania, and received by her from Orlando, Florida, proved to be of this insect. They were small, 0.025 inch ($\frac{1}{40}$) in diameter, round, irregularly punctate, changing before hatching from whitish to reddish and finally purplish (Mr. Dyar gives the color as yellowish pearly gray). The duration of this stage was about five days. Less than one-half of the shell was eaten by the larva upon its escape.

While many of the Arctians are known to be quite prolific, this one is markedly so, for Mr. Dyar records an instance in which he obtained 2274 eggs from one individual.

Notes on the Larval Stages.

October 7th. Larva after hatching 0.05 inch long, yellowish, with brown dorsal tubercles on segments 4 and 5 (apodal), 8, 9, 10 and 12, appearing, from above as if two-banded; head reddish, with a conspicuous black spot on each side over the ocelli; hair nearly as long as the body; legs long. Larva feeds readily on plantain.

October 15th. First molting commenced; on the 16th, 10 had molted, and the last on the 20th. Appearance much as before, except that the subdorsal spots on segments 4, 5, 8, 9 and 10 are dark reddish-brown, extending around and below the tubercles—those on segments 4 and 5 also embracing the lateral tubercles, making almost a band upon these segments, except as separated by a pale dorsal line. Terminal segment without brown. Head brownest at the slightly lobed apex. Hairs fuscous, longer than the diameter of the body.

October 19th. Second molt commenced; on 20th, 12 had molted. Length, 0.2 in. Hairs black, about the diameter of body in length. Head pale reddish, a blackish crescent over the ocelli. Body honey yellow. Segment 3 with four brown tubercles dorsally; segments 4 and 5 brown dorsally and laterally; segments 8 to 10, brown dorsally only (over the two subdorsal rows of tubercles). The molting was completed on the

25th, when the earliest had taken the position for the 3d molt, having a length of 0.35 in. The preparation for the molt is made by leaving the plant and selecting a place on the top of the jar containing the larvæ, where each spins a web of three times the area of its body, in which it may securely fasten its prolegs—such attachment being apparently necessary for its successful escape from the cast skin.

October 27th. Third molt commenced. Ended on the 30th. Color dull red. The brown has become black and its area is extending, as segment 3 is also black, in addition to 4, 5, 8 to 10. On the terminal segment (12) the two subdorsal tubercles are shining-black. On the evening of the 31st, the first two took position for the 4th molt—length 0.45 in. With very few exceptions (the result perhaps of disturbance) the larvæ after their molting reverse their position and entirely consume their exuvia.

November 1st. Fourth molt commenced—1 molted; on 2d, 10 molted; on 3d all of previous molt had ceased feeding, and were in position on the lid and sides of the glass jar, for their approaching molt—a few only remained upon the leaves. The molting was completed on the morning of the 5th. Portions of about 20 per cent. of the exuviae were uneaten. In several instances the larvæ were seen to commence feeding upon the spines, biting them off in small pieces, before attacking the skin. The withdrawal from the old skin occupied about a minute. The spines, first appressed to the body beneath the old skin, appear as wet places, but at once begin to expand and dry. Their final adjustment is apparently hastened by the contortions in which the larva throws itself, by resting on three pairs of prolegs, and with the two extremities raised and curved over the back, almost touching one another, frequently twisting, at short intervals, from side to side. In about an hour after emerging, the meal upon the exuviae is commenced.

With its longer spines, the caterpillar is now nearly twice as broad as before, but not much increased in length, averaging but 0.5 in. The central and terminal segments are still red, but diminished in extent and less conspicuous than before—the red of the extremities being nearly concealed beneath the long black spines radiating from the tubercles. The legs, prolegs, and ventral surface are red, the plantæ of the prolegs being quite pale—almost a flesh color. The spines on segments 6 and 7 are dusky, interspersed with a few black ones; length of spines equal to the diameter of the body. The head is red with black ocelli, the mandibles black-tipped, and with a few perpendicular black lines on the clypeus. On the 5th the more advanced larvæ show the red ring on the

incisures characteristic of the adult form. On the 6th a larva took position for its molt, on the 7th two others, and ten on the 8th. At this time they measure 0.9 inch in length.

November 8th. Fifth molt commenced—one larva molted; ten more were found to have molted on the morning of the 10th; the last molted on the 15th—the molting of this stage extending over seven days. At the end of this stage they average in length 1.6 in. at rest and 2 in. when in motion. All the spines are black, except some lateral ones in a few individuals, which are brownish; they are minutely barbed to the naked eye and distinctly so under a magnifier (Pl. iv, fig. 1). The segments are black dorsally, except the thoracic and the last two which are a reddish-brown, as are the sides below the spiracles. The red incisural bands commence behind the 4th segment and continue until after the 10th, being seven in number; the central ones being about one-third as long as the black portion of the segment.

November 17. Sixth molt commenced—all the larvæ remaining upon the leaves. The molting terminated on the 23d—continuing six days. In every instance in this molt, the head-case remained attached to the skin. The exuvia shows distinctly a central lateral patch of dusky scales. Fewer of the exuviae were eaten (26 per cent only), owing doubtless to the stronger and more rigid spines. All the spines are black and all the segments are black dorsally.*

November 25. Seventh molt commenced—terminated on December 4th,—continuing nine days. Length 2.4 inches, at rest; when extended in feeding, 3 inches.

December 1. A caterpillar commenced spinning its cocoon on the side of its feeding cage and the glass cover; for convenience it was transferred to another box. On the 3d inst. a second one had commenced.

December 13. The first pupa was observed, from the caterpillar that had commenced to spin up December 1st. Two more molted on December 14th. On the 30th, the last larva was transferred to a box for pupation.

* If the preceding notes are compared with Dr. Dyar's description of the early stages of this insect (see *Canadian Entomologist*, xxiii, 1891, pp. 106-107), some differences will be detected. Most of these can undoubtedly be accounted for by the natural variations of the species under differing conditions.

TABLE OF LAST TRANSFORMATIONS.

SPUN UP.	Pupated.	Emerged.	Sex.	Pupal period.
December 1	December 13	January 15	....	33 days.
" 3	" 18	" 16	♀	29 "
" 10	" 20	" 18	♀	29 "
" 12	" 21	" 18	♀	28 "
" 12	" 22	" 19	♀	28 "
" 12	" 21	" 19	♀	29 "
" 12	" 22	" 21	♀	30 "
" 12	" 22	" 22	♂	31 "
" 15	" 22	" 20	♀	29 "
" 16	" 24	February 1	....	39 "
" 16	" 25	January 30	....	36 "
" 17	" 25	" 20	♀	26 "
" ?	" 25	" 26	....	32 "
" ?	" 25	February 1	....	38 "
" ?	" 25	" 6	....	43 "
" 17	" 26	" 5	....	41 "
" 19	" 28	January 31	....	34 "
" 19	" 28	February 6	....	40 "
" 19	" 28	" 5	....	39 "
" 20	" 28	January 22	♂	25 "
" 21	" 28	February 2	....	36 "
" 21	" 28	" 6	....	40 "
" 22	" 28	" 11	....	45 "
" 22	" 28	" 14	....	48 "
" 22	" 28	January 26	....	29 "
" 22	" 29	February 13	....	46 "
" 22	" 30	" 5	....	37 "
" 25	" 30	" 7	....	39 "
" 25	" 28	" 1	....	35 "
" 25	" 31	" 10	....	41 "
" 25	January 3	" 20	....	48 "
" 27	" 3	" 17	....	45 "
" 27	" 3	March 4	....	60 "
" 30	" 4	February 20	....	47 "
January 3	" 7	" 25	....	49 "
" 3	" 7	March 1	....	53 "
" 3	" 8	February 17	♀	40 "
" 5	" 12	Crippled	....	.....
" 6	" 12	February 12	♀	31 "
" 10	" 15	" 12	♀	28 "

In the above table is given in detail the time occupied in the last two transformations of forty individuals of this interesting insect within cases which had been kept upon my office table at the State Museum

It will be seen by consulting it, that the shortest period between the spinning up of the larva and pupation was but three days,—the longest fifteen, and the average a little over seven days and one-half. The shortest period of pupation was twenty-five days, and the longest sixty — the average being nearly thirty-eight days.

The Pupa.

The larva spins a thin netting of yellowish silk with little amber beads at the joining of the threads just before pupating. No description of the pupa was made, but it has been described by Dr. Dyar as follows:

“Robust, of normal shape; on the abdominal segments, dorsally and subventrally are ten rows of large tufts of short spiny hairs, the tufts smaller ventrally and less numerous posteriorly; cremaster, two tufts of reddish spines from elevated bases. Color black, reddish in the abdominal incisures; the body is smooth and dull, the wing cases more shiny, creased. Spiracles linear, reddish. Length 35 mm., width 13 mm.”

The Imago.

This beautiful insect with a wing-spread of from two and three-quarter inches in the male to three and a half in the female is a desirable addition to the cabinet of a collector. Its lustrous blue abdomen marked with orange down the middle and on the sides, and the sharp black markings of the thorax and wings on a white background, give the insect a striking appearance. There is considerable variation in the markings in different individuals as will be seen on plate 1, and particularly so when the sexes are compared. The irregular black rings that adorn the thorax and wings of the female, tend to become black spots in the male, as seen in figure 2 of plate 1. More often, however, the costal and some of the smaller discal rings on the wings and those of the thorax are replaced by spots (see figures). It will also be noticed that the posterior thoracic spots of the male are frequently blue, while in the female the corresponding marking are a much darker blue or a black.

A variety of this species, *denudata* Slosson, in which the tips of the primaries are invariably denuded, has been described from Florida.

Life-History.

So far as known there appears to be but a single annual generation. The nearly full-grown larvæ are commonly observed in the autumn, and in this stage usually hibernate. The caterpillars can successfully withstand a great degree of cold. They may even be revived after having

been frozen stiff and partially encased in ice. In Kentucky the insect spins up about the first of June and the moths emerge about the 15th. Under exceptional conditions the insect pupates in the autumn and the imago is disclosed before winter sets in.

The only recorded parasite of this species appears to be *Ophion arcticæ* Ashm., which was reared from it at Columbia, S. C.

Food-plants.

The insect is a very general feeder in its travels over the ground as it approaches maturity, and eats from almost any plant that it chances to meet with except the coarser ones. It will also climb low trees and feed on the foliage. Among its favorite food plants are some of the Compositæ, the wild sun-flower (*Helianthus*) being one commonly eaten by the larva. It has also been recorded as feeding on the willow, poke berry, and black locust in nature. In confinement it has been reared successfully on cabbage, the plantain, castor bean (*Ricinus communis*), and the spurge (*Euphorbia cyathophora*).

Distribution.

This insect has a wide distribution, being comparatively abundant throughout most of the northern United States and in many parts of Canada. In some of the southern swamps it is quite common, and in those regions it has been known as "Fever-worm" among the negroes from a mistaken impression that this caterpillar is the cause of the ague.

An Innoxious Insect.

The injuries resulting from this insect are seldom, if ever, serious, as it is nowhere known as a common pest, and it rarely causes any damage worthy of notice. This would naturally result from their restlessness, which does not allow them to remain long in one place, and from their food consisting largely of comparatively valueless plants.

Leucania unipuncta (Haworth).*The Army-Worm.*

(Ord. LEPIDOPTERA: Fam. NOCTUIDÆ.)

- COMSTOCK: Rept. upon Cotton Insects, 1876, p. 11 (mention), pp. 101, 106 (mistaken for *Aletia*), pp. 202, 203 (*Nemoræa leucaniæ* and *Exorista flavicauda* valuable parasites of *Heliophila unipuncta*).
- SMITH: in Rept. upon Cotton Insects, 1879, p. 259 (*Leucania unipuncta* attracted to sweets); Cat. Ins. N. J., 1890, p. 316 (common all over the State); List Lepidopt. Bor. Amer., 1891, p. 46, no. 2280; in Rept. N. J. Agric. Expt. Stat. for 1890, 1891, pp. 514-515, figs. 27, 28 (remedies); in Entomolog. News, vii, 1896, p. 204 (brief notice of ravages in 1896); Economic Entomol., 1896, pp. 294-296, figs. 332, 333 (brief general account); in Rept. N. J. Agric. Expt. Stat. for 1896, 1897, pp. 433, 434, 449-457, figs. 1-5 (recent injuries in N. J.; general account).
- HICKS: in Amer. Entomol., iii, 1880, p. 227 (ravages in Queens Co., N. Y. in 1880).
- LINTNER: in Country Gentleman, for July 1, 1880, xlv, p. 424 (eggs identified); in id., for June 2, 1881, xlv, p. 359 (reference); 1st Rept. Ins. N. Y., 1883, pp. 33, 53 (remedies), pp. 100, 127, 128, 132, 134-135, 146, 147, 226, 312-313, 314 (references); 2nd do., 1885, pp. 43-44 (injuries in N. Y.); 4th do., 1888, pp. 139, 163 (references); 6th do., 1890, pp. 176, 179-180 (references); 7th do., 1891, pp. 373, 376 (references); in Country Gentleman, for October 6, 1892, lvii, p. 750 (remedies); 8th Rept. Ins. N. Y., 1893, pp. 265, 293 (references); 9th do., 1893, p. 443 (reference); in Country Gentleman, for June 29, 1893, lviii, p. 508 (reference); 10th Rept. Ins. N. Y., 1895, pp. 482, 490, 519 (references); in The Argus [Albany, N. Y.], for July 8, 1896, p. 8 (ravages in N. Y., remedies); the same, in part, in the New York Recorder, for July 15, 1896; in Country Gentleman, for July 16, 1896, lxi, p. 552; in Rome Sentinel, for July 10 and 17, 1896; in Circular of the Department of Agriculture of the State of New York; in New York Daily Tribune, for July 18, 1896 (injuries in Eastern N. Y., remedies); in Country Gentleman, for July 23, 1896, lxi, p. 574 (extent of injuries, remedies); in id., for August 6, 1896, lxi, p. 606 (ravages at Orchard Home, N. Y., remedies); in Bull. 6 New Ser., Divis. Entomol., U. S. Dept. Agric., 1896, pp. 55-56 (ravages in New York).
- MANN: in Psyche, iii, 1880, pp. 91, 93, 115, 118 (references to ravages of army-worm in Mass. and vicinity), 1881, p. 226 (reference); in do., iv, 1884, p. 210 (reference).
- DIMMOCK: in Psyche, iii, 1881, pp. 212, 282 (numerous references to ravages in New England and Nova Scotia), pp. 287, 345 (references); in do., iv, 1885, p. 295 (reference); in do., v, 1888, p. 141 (reference).

- SAUNDERS: in *Canad. Entomol.*, xiii, 1881, pp. 198-199 (in Ontario and Western States); the same in *Ann. Rept. Entomolog. Soc. Ont.* for 1881, 1882, p. 6.
- THOMAS: 10th Rept. Ins. Ill., 1881, pp. 5-43, figs. 1-5 (extended account).
- COQUILLETT: in 11th Rept. Ins. Ill., 1882, pp. 8, 49-64 (habits and life-history).
- GODING: in *Trans. Iowa State Agricul. Soc.* for 1882, 1883, separate, p. 9 (brief account).
- COOKE: *Inj. Insects Orch.-Vineyard*, 1883, pp. 282-283, figs. 269-271 (brief general account).
- FORBES: in *Trans. Miss. Valley Horticul. Soc.*, 1883, separate, p. 7 (strawberries stripped of leaves by army-worms); 12th Rept. Ins. Ill., 1883, p. 102, fig. 22 (ravages in Ill.); 13th do., 1884, pp. 9, 40, 61, 84, pl. VI, figs. 1, 2 (notes on habits, remedies); 14th do., 1885, p. 5 (mention); 15th do., 1889, pp. 2-3 (mention, as *Heliophila unipuncta*); 16th do., 1890, p. ix (mention); *Append.* to 17th do., 1891, pp. 25, 35 (references to Le Baron); 18th do., 1894, pp. x, 14 (mention); 19th do., 1896, p. 76 (experiment on larvæ).
- REED: in 13th *Ann. Rept. Entomolog. Soc. Ont.*, 1883, p. 52 (*Nemoræa leucania* a parasite).
- RILEY: in 3d Rept. U. S. Entomolog. Comm., 1883, pp. 89-156, pls. I, II (an extended account); in *Canad. Entomol.*, xv, 1883, p. 173 (duration of transformations); the same in 14th *Ann. Rept. Entomolog. Soc. Ont.*, 1884, p. 19; 4th Rept. U. S. Entomolog. Comm., 1885, p. 19 (mistaken for *Aletia*), pp. 350-351, pl. V (brief account), *Append.*, p. [102] (note on appearance); in *Insect Life*, iii, 1890, pp. 183-184 (mention); *Bull.* 31 *Divis. Entomol.*, U. S. Dept. Agricul., 1893, pp. 41, 54, 57 (exhibit of at World's Columbian Exposition); in *Insect Life* vi, 1894, p. 222 (living examples in Mexican cereals at World's Fair).
- FERNALD: in *Kingsley's Stand. Nat. Hist.*, ii, *Crust. and Ins.*, 1884, p. 451, figs. 568, 569 (brief notice, both as *Heliophila* and *Leucania unipuncta*); in 34th *Ann. Rept. Mass. Agricul. Coll.*, 1897, p. 186 (mention).
- HUBBARD: in 4th Rept. U. S. Entomolog. Comm., 1885, *Append.*, p. [6] (not in Florida).
- VAN DUZEE: in *Canad. Entomol.*, xvii, 1885, p. 80 (*Aphis mali* attracting *L. unipuncta* moths).
- WEBSTER: in *Ind. Agricul. Rept.* for 1885, 1886, separate, p. 18, pl. 4, figs. 2, 3 (injuring corn); in *Insect Life*, iii, 1890, pp. 112-113 (in Indiana, ovipositing in corn); in *Bull.* 22 *Divis. Entomol.*, U. S. Dept. Agricul., 1890, pp. 45-46 (damages in Ind., parasites); in *Insect Life*, vi, 1893, p. 150 (but one brood injurious in Ohio); the same in 24th *Ann. Rept. Entomolog. Soc. Ont.*, 1894, p. 89; *Bull.* 51 *Ohio Agricul. Expt. Stat.*, 1894, p. 125 (distribution), p. 133 (reference); in *Bull.* 6 *New Ser.*, *Divis. Entomol.*, U. S. Dept. Agricul., 1896, p. 66 (injuries in Ohio).

- COOK: in Entomolog. Amer., i, 1886, p. 209 (ravages); Bull. 76 Mich. Agric. Expt. Stat., 1891, p. 14 (reference).
- BETHUNE: in 17th Ann. Rept. Entomolog. Soc. Ont., 1887, p. 59, figs. 33, 34 (brief mention); in 27th do. for 1896, 1897, pp. 55-56 (damage in Ontario).
- BRUNER: in Insect Life, i, 1888, p. 66 (in S. Dak., Nebr. and Wyoming); in Bull. 22 Divis. Entomol., U. S. Dept. Agric., 1890, p. 98 (damage in Nebr., parasites); in Bull. 23 do., 1891, p. 14 (injuring beet); in Ann. Rept. Nebr. State Bd. Agric., 1893, pp. 390-394, figs. 35-41 (brief general account); in Bull. 32 Divis. Entomol., U. S. Dept. Agric., 1894, pp. 14-15 (injuries in Nebr. in '93).
- FLETCHER: Ann. Rept. for 1887, 1888, pp. 11-12, figs. 1, 2 (life-history, ravages in Canada, remedies); in 19th Ann. Rept. Entomolog. Soc. Ont., 1889, p. 9 (brief mention); Ann. Rept. for 1894, 1895, pp. 192-194, figs. 2, 3 (life-history, ravages in '94 in Canada, remedies); in 27th Ann. Rept. Entomolog. Soc. Ont. for 1896, 1897, pp. 59-60 (injuries in Ontario); in Rept. Canad. Experimental Farms for 1896, 1897, pp. 231-234, figs. 3, 4 (general account of, in Canada).
- HULST: Bull. xlvii N. J. Agric. Expt. Stat., 1888, pp. 6-7 (remedies, brief); in Entomolog. Amer., v, 1889, p. 58 (contagious disease of army-worm).
- BURNETT: in Insect Life, i, 1889, p. 287 (in Orleans Co., N. Y. in 1888).
- DYAR: in Insect Life, i, 1889, p. 285 (moth attracted to electric light).
- DANSBY: in Insect Life, i, 1889, p. 375 (injuries in Florida).
- MILLER: in Insect Life, ii, 1889, pp. 76-77 (ravages in Indiana).
- RILEY-HOWARD: in Insect Life, i, 1889, p. 356 (reference); in do., ii, 1889, p. 56 (ravages in Ind.), 1890, p. 258 (mention), p. 351 (*Rhogas terminalis* Cr. reared); in do., iii, 1891, pp. 15, 17, 153, 154, 156, 157, 460 (reared parasites), p. 478 (mention); in do., iv, 1891, p. 157 (in the island of Jamaica); in do., vi, 1893, p. 41 (ravages in N. Mex. and Va.), 1894, p. 348 (mention), p. 374 (injuries reported in various localities); in do., vii, 1894, p. 269 (ravages in Va. from May to Sept.), p. 279 (abundance of moths at electric light).
- TOWNSEND: in Insect Life, ii, 1889, p. 42 (destructive in Mich. in '81); in Psyche, vi, 1893, pp. 466, 467, 468 (flies bred from *Leucania unipuncta*).
- ASHMEAD: in Insect Life, iii, 1890, pp. 53-57 (ravages in Md. in 1880).
- HOWARD: in Insect Life, ii, 1890, p. 222 (irrigation for controlling); Circular 4 2d Ser., Divis. Entomol., U. S. Dept. Agric., 1894, pp. 1-5, figs. 1-3 (brief general account); in Proc. Entomolog. Soc. Wash., iii, 1895, p. 225 (of distribution); Bull. 5 Technical Ser., Divis. Entomol., U. S. Dept. Agric., 1897, pp. 33, 50 (mention), p. 51 (*Winthemia 4-pustulata* a common parasite).

- OSBORN: in Bull. 22 Divis. Entomol., U. S. Dept. Agricul., 1890, pp. 20-21 (mention); in Insect Life, v, 1892, p. 112 (mention); in Bull. 30 Divis. Entomol., U. S. Dept. Agricul., 1893, p. 44 (injuries in Iowa in '92); in Bull. 33 Io. Agricul. Coll. Expt. Stat., 1896, pp. 600-603, figs. 3-5 (injuries in Iowa, brief general account); in Bull. 6 New Ser., Divis. Entomol., U. S. Dept. Agricul., 1896, p. 78 (injuries in Iowa).
- HARRINGTON: in 21st Ann. Rept. Entomolog. Soc. Ont., 1891, p. 67 (*Ophion purgatum* a parasite).
- KOEBELE: in Bull. 23 Divis. Entomol., U. S. Dept. Agricul., 1891, p. 44 (mention).
- MOFFAT: in 21st Ann. Rept. Entomolog. Soc. Ont., 1891, pp. 51-54, figs. 21, 22 (ravages in Maritime Provinces and Eastern States); in 27th do. for 1896, 1897, pp. 77-78 (injuries in Ontario, etc.).
- COCKERELL: Bull. 10 N. Mex. Agricul. Expt. Stat., 1893, pp. 10-14 (food-plants and remedies); in Insect Life, vii, 1894, p. 210 (mention).
- GILLETTE: in Rept. Col. Agricul. Expt. Stat. for 1893, 1894, p. 53 (brief mention).
- THOMPSON: in Insect Life, vi, 1893, p. 37 (in Tasmania).
- GARMAN: in 5th Ann. Rept. Ky. Agr. Expt. Stat., 1894, pp. 56-59, fig. 8 (brief account as *Heliophila*); in 7th do. for 1894, 1895, p. xxxvii (very common in Ky., May 23, June 25-Sept. 1).
- MURTFELDT: in Bull. 32 Divis. Entomol., U. S. Dept. Agricul., 1894, p. 37 (injuries in Mo. in 1893).
- COMSTOCKS: Manual Study Insects, 1895, pp. 303-304, figs. 366, 367 (brief notice).
- FORBUSH: in The Gypsy Moth, a Rept. of the Work Mass. Bd. Agricul., 1896, p. 33 (gypsy moth mistaken for army-worm), p. 121 (cyclone burner for army-worm).
- LOUNSBURY: Bull. 28 Mass. Agricul. Expt. Stat. (Hatch), 1895, pp. 10-17, figs. 5-7 (cranberries injured, general account).
- MCCARTHY: in Bull. 115 N. C. Agricul. Expt. Stat., 1895, pp. 164-165 (remedies, as *Heliophila*).
- HOPKINS-RUMSEY: Bull. 44 W. Va. Agricul. Expt. Stat., 1896, pp. 261-262, 310, 312, 316 (brief description, remedies).
- JOHNSON: in 9th Rept. Md. Agricul. Expt. Stat., 1896, p. 225 (ravages in Sept.).
- KIRKLAND: in Bull. 3 Series of 1896, Mass. Crop Rept., July, 1896, pp. 28-37, figs. 1-6 (general account of in Mass.); Bull. 46 Hatch Expt. Stat. Mass. Agricul. Coll., 1897, p. 23 (toads eating army-worms).
- LOWE: Bull. 104 N. Y. Agricul. Expt. Stat., 1896, pp. 121-129, figs. 1, 2, pls. I, II (general account and recent ravages).
- LUGGER: 2d Ann. Rept. Entomol. State Expt. Stat., Univer. Minn., for 1896, pp. 14-20, figs. 8-10, pl. II, fig. 11 (recent injuries in Minn., general account); the same in Bull. 48 Minn. Agricul. Expt. Stat., 1896, pp. 42-48.

- PERKINS: in 9th Rept. Vt. Agricul. Expt. Stat., 1896, pp. 134-142, figs. 20-25 (general account of, in Vermont).
- TRUMAN: in Entomolog. News, vii, 1896, p. 299 (common in South Dakota).
- WEED, C. M.: Bull. 39 N. H. Coll. Agricul. Expt. Stat., 1896, pp. 62-75, figs. 1-10 (general account of, in New Hampshire).
- BROOKS: in 34th Rept. Mass. Agricul. Coll., 1897, pp. 82-84 (damage by, on college farm).
- CHITTENDEN: Bull. 8 New Ser., Divis. Entomol., U. S. Dept. Agricul., 1897, p. 42 (*Carcelia leucania* a common parasite).
- DEARNESS: in 27th Ann. Rept. Entomolog. Soc. Ont. for 1896, 1897, p. 23 (injuries in Ontario).
- FYLES: in 27th Ann. Rept. Entomolog. Soc. Ont. for 1896, 1897, pp. 101-102 (brief mention).
- PANTON: in 27th Ann. Rept. Entomolog. Soc. Ont. for 1896, 1897, pp. 44-51, figs. 45-50, 1 map (general account of distribution and ravages in Ontario).
- BRITTON: in 20th Rept. Conn. Agricul. Exp. St. for 1896, 1897, pp. 236-238, pl. 3, figs. a-d (in Conn., natural history, remedies).
- SLINGERLAND: in Proc. 42nd Ann. Meet. West. N. Y. Horticul. Soc., 1897, pp. 23-24 (brief account of ravages in 1896 in New York); in Amer. Agricul., 59, for May 8, 1897, p. 582 (rarely injurious a second year); Bull. 133 Cornell Agricul. Expt. Stat., 1897, pp. 233-258, figs. 68-72 (extended account, in New York).
- SOULE: in Psyche, viii, 1897, p. 11 (moths swarming in New Hampshire and at sea).

(The references above are additional to those given in the extended account of this insect by Prof. Riley in the 3rd Report of the U. S. Entomological Commission, 1883, pp. 146-156).

The notable entomological event of the year (1896) for the State of New York, has been the occurrence and severe ravages of the army-worm, *Leucania unipuncta*, over the greater part of the State. This insect is a quite common species, which is widely distributed over the country. When but moderately abundant it is but rarely, if ever, noticed by the farmer; occasionally, however, the caterpillars are so numerous and destructive as to create much alarm and lead to many wild surmises as to their origin.

Unprecedented Ravages in the State of New York.

The abundance of the caterpillars and the damage by them to the crops throughout the State is believed to be greater than had ever been observed before. Previous ravages of this insect in the State have been confined to limited portions, but the past year it has been destruc-

tive over by far its greater portion, ranging from its extreme east to the west and from the north to the south. The insect has been authentically reported from fifty-five of the sixty counties, but has probably been present, to a greater or less extent, in all. The following are known to have been infested to a greater or less extent :

Albany.	Essex.	Oneida.	Schuyler.
Allegany.	Franklin.	Onondaga.	Seneca.
Broome.	Fulton.	Ontario.	St. Lawrence.
Cattaraugus.	Genesee.	Orange.	Steuben.
Cayuga.	Greene.	Orleans.	Suffolk.
Chautauqua.	Herkimer.	Oswego.	Sullivan.
Chemung.	Jefferson.	Otsego.	Tioga.
Chenango.	Kings.	Putnam.	Tompkins.
Clinton.	Lewis.	Queens.	Ulster.
Columbia.	Livingston.	Rensselaer.	Washington.
Cortland.	Madison.	Rockland.	Wayne.
Delaware.	Monroe.	Saratoga.	Westchester.
Dutchess.	Montgomery.	Schenectady.	Wyoming.
Erie.	Niagara.	Schoharie.	

It has not been reported, so far as known, in the following counties : Hamilton, New York, Richmond, Warren and Yates.

From the nature of the attack, and from the reports at hand, it would be useless to estimate the damage caused by this insect to the farming interests of the State of New York the past year. The habit that the caterpillars have of feeding largely under cover of darkness, renders it quite safe to assume that in each of the fifty-five counties from which they have been reported, considerable injury to the crops has resulted. Besides the injuries reported, there are many individuals who have suffered considerable loss in silence. In addition to this, there is also the damage inflicted by the insect unknown even to the owners of the property involved. The two latter items would swell the total loss caused by this insect in the State the past year to a very formidable sum. The following newspaper items will give some idea of its abundance and destructiveness in the State of New York in its recent invasion :

In the vicinity of Easthampton [L. I.] the army-worm has appeared to the number of many thousands and has destroyed crops belonging to farmers, as well as fields and lawns of private residences.

The Journal, July 9.

The so-called army-worm was brought to my notice during the first week in July. It was then attacking the oat fields in northern Westchester and southern Putnam counties. It developed northward into Putnam county with great rapidity, and much alarm was felt, although it was hoped that many fields would escape and be cut later for the grain.

On July 12th all hope of saving the grain was abandoned and every oat field was hastily cut with scythe and mowing machine to save the straw for fodder. At this time many oat fields were utterly ruined on the southern border of the county, and those farther to the north were seriously injured in part. The oats in this section were unusually vigorous, the straw in many places measuring five feet in height, with leaves long, broad and succulent. The heads were heavy and well filled. In fact, the worms were well supplied with ample food and made a rapid development.

G. W. H. Brewster (Putnam county), N. Y.

The army-worm has destroyed a considerable portion of the crops in Dutchess and Orange counties within the past two weeks.

The Independent, New Paltz (Ulster county) July 24.

The much dreaded army-worm has invaded Columbia county and is working havoc with the crops in several towns. Over in Kline Kill the destructive pests have appeared in alarming numbers * * * *. They are also attacking growing vegetation on Abm. Vosburgh's land in Ghent. In Kinderhook the Scully farm is overrun with the worms which are spreading from field to field, devouring everything in their progress, except potatoes. Several other farms in the same town are also suffering from the pest.

Chatham Republican (Columbia county), July 15.

Wherever the worm appears ruin follows its tracks, and many a farmer sees all prospect of abundant harvest fade away in a few hours. From the Plains come numerous accounts of their ravages, which are also reported on the South Side, where H. F. Slade had a fine piece of oats, covering eight acres, and last week estimated to yield 75 bushels to the acre. Sunday the worms were seen in the field for the first time. Monday their ravages had become so apparent, that it was decided to save the remainder of the crop by harvesting it at once. On Tuesday when it was cut with a reaper, the leaves had all been eaten off, and in many instances the head also, so that the field is nearly a total loss.

The Oneonta Herald (Otsego county), July 16.

In Chenango county the worms have confined their destructive work to the lowlands. Along the roads and fences, great swarms or droves of the pest may be seen making their way in one great wriggling, squirming mass from field to field. In Oxford the old fair grounds had been sown to oats and corn and also the pieces adjoining them. The worms migrated from one field to another, and in doing so, crawled over the building once used as a grand stand, that being used in place of a fence. The structure was one moving mass and attracted much attention from the village and surrounding country.

The Watertown Reformer (Jefferson county), July 18.

Anyone wishing to see the army-worm, should go to the Fairbanks farm on North Main street, near the Catholic cemetery, where the worms may be seen by the million in the oat fields. Every stalk and spear is literally covered with them. Mr. Fairbanks has as fine a piece of oats as is often seen in this section, but the terrible ravages of this pest will, in a few days, destroy the entire crop. The ground is so thickly covered with them, that it is impossible to step without treading on some.

The Jamestown Journal (Chautauqua county), July 10.

Farmers owning land on the west side of Black river, just east of Lowville [Lewis county], will have a new pest to contend with, and one that is making great havoc in pastures and meadows. The pest is a smooth, dark colored worm, about one and one-half inches long, resembling the army-worm. They made their appearance about a week ago, and as to numbers represent a vast army. They move in solid masses and devour everything in their track. Pastures that have been attacked are as barren of feed as a street pavement.

Oswego Times, July 10.

The army-worm has reached South Trenton [Oneida county], and is working sad havoc in the oat and corn fields. One prominent farmer who expected to raise about 400 bushels of oats said this week, after seeing the worms at work in his field, that he probably would not have a solitary oat. The worms appear very ravenous and have been known to eat grass that had matured and turned brown.

Utica Semi-Weekly Herald, July 17.

The army-worm which is working among farmers' crops in the eastern part of the State, is doing considerable damage at Walworth [Wayne county]. T. G. Yeomans & Sons, the leading farmers in the town of Walworth, seem to be troubled most with the worm, which began eating the grass in the pastures, whereupon the grass was set afire so as to get rid of them. Then the fodder corn was next tackled by the pest.

Rochester Democrat and Chronicle, July 22.

Earlville [Madison county], July 15. — The army-worms have reached this section and are doing their destructive work among the farmers by devouring their corn and oats in large quantities. This is the first time the worms ever appeared in this vicinity, and are thought to be passing by and steadily moving northward.

Rome Sentinel, July 17.

In the town of Bethlehem, Albany county, near the farm of Hon. John M. Bailey, they were seen by me on July 7th, completely eating up every hill of corn in their progress over a large field (Pl. II, also IV, fig 2). A piece of timothy was badly eaten and rapidly being consumed by the host of hungry caterpillars — the heads bending down beneath their weight. They were found in millions in the field of rye in which they were first noticed, and as the rye was being cut, they were in thousands underneath the sheaves. They were reported on a farm just outside of Albany on Delaware avenue as eating everything before

them—oats, corn, and many vegetables, while they were so thick that one could not take a step without crushing many of them. So abundant were they that if a man stood still for a few minutes, they would crawl upon him in so great numbers that he could not easily divest himself of them. They were also very numerous just beyond the toll-gate on Western avenue where they had stripped all the leaves from a number of fields of fine looking oats, and leaving these, many had wandered on to the plank road where large numbers were crushed by passing vehicles.

The serious nature of the ravages of this insect was evidenced by the many telegrams and letters received concerning it, — the replies to which formed a considerable part of the correspondence of the Office for the month of July. In addition, numerous inquiries relating to the new depredator were sent to the Commissioner of Agriculture, to the Experiment Stations at Ithaca and at Geneva, and to the branch Station at Jamaica, Long Island.

In response to a telegram, the State Entomologist visited Governor Morton's farm at Ellerslie, and found that hordes of hungry worms were threatening the destruction of nearly 200 acres of his corn and oats. The condition of affairs was found to be exceedingly alarming, and it was only by the work of fifty men continued long into the night that the crops were in the main preserved. In a similar manner the army-worms were destroying the corn of George Canaday of Kinderhook, N. Y., at the rate of an acre a day. Mr. Canaday at once sent a special messenger with examples of the caterpillars to the office of the State Entomologist, to learn the proper methods of combating this enemy. The prompt action of this gentleman in accordance with the directions given him, enabled him to protect the greater portion of his fields.

Its Work in Other States.

The ravages of the army-worm during the year have also been marked in other States of the Union. Serious outbreaks occurred in Maine, and in the central and southern portions of New Hampshire and Vermont. In Massachusetts the cranberry crop in the three towns of Dennis, Harwich and Yarmouth on Cape Cod, was damaged to an estimated extent of \$100,000. The injury to the grass and grain crops in the State, was estimated at fully \$200,000, making a total loss by the army-worm of over \$300,000. Serious ravages by this insect were also reported from Connecticut.

In New Jersey the insect was quite destructive in limited localities in different portions of the State. The damage in Pennsylvania appears to

have been severe and extensive over a large part of the State—Centre, Tioga, Bradford, Susquehanna, Chester, Dauphin, Perry, Bucks, Lancaster, York and Cumberland counties, being the most unfortunate in this respect. It was widespread in Ohio, although its injuries were local and could be hardly termed general. It was reported as quite injurious in Marinette, Menominee and Monroe counties, in Wisconsin. In Minnesota its ravages extended over most of the State, and were represented as very severe. It was reported as more or less destructive in the following additional States: Missouri, California, Maryland and Iowa. In towns of the Province of Ontario, Canada, it was also quite injurious.

Earlier Losses in the State of New York.

The first authentic record of injury in this State by the army-worm, so far as we have found, was given by the Albany Argus in 1817. In this year many meadows and pastures in the northern towns of Rensselaer county, and in the eastern portions of Saratoga county were rendered "as barren as heath" by this insect. In 1842 some injury from it, was reported in the western part of the State. It committed severe ravages in the vicinity of Buffalo in 1861, also near the head of Seneca lake, and at several other points in the southern and western counties. In 1871 it was reported from Tioga county. Four years later it attracted attention the latter part of July, and in the middle of August it was quite abundant on Long Island. In 1880, it was again destructive in this State. The caterpillars appeared in June on Long Island, where they caused much alarm by their ravages. At this time they also occurred in some of the southern and eastern counties of the State.

It will be seen from the above that all the earlier appearances of this pest have been limited to comparatively small areas in the State, and, although the losses were considerable in some instances, especially in the visitation of 1880, it is believed that none approached in magnitude those of the present year.

Its Extended Distribution.

The army-worm has a remarkably extended distribution. Dr. Packard, in his map published in 1877, limited its range as follows: north, at latitude 48° in Minnesota, and at Cape Rozier in Quebec; east by the eastern portion of Nova Scotia; south, at the southern point of Texas; west, at parallel 102° . This range can now be considerably extended. It has been reported from Newfoundland, Prince Edward Island, and as widespread all over Canada. In the United States, in addition to the area given by Dr. Packard, the insect has been reported from South Dakota, Nebraska, Wyoming, Colorado, New Mexico; and the past

summer, "The Weekly Chronicle" reported ravages of the army-worm in July in the vicinity of Stockton, California. If the latter report can be regarded as authentic, it is safe to infer that the insect is, or may occur very soon, in every State in the Union.

Living specimens were also observed to issue from Mexican cereals exhibited at the World's Fair held at Chicago.

It has been recorded from the Island of Jamaica, and will probably be found in other islands of the West Indies. Other localities are: various parts of South America, — Venezuela, United States of Colombia, and Brazil; Isle of Wight; Lewes, South England; Maderia; Province of Nepaul, North India; Java; several places in Australia; New Zealand and Tasmania. *Leucania unipuncta* may well be deemed cosmopolitan, although only in the United States does its ravages attract much attention.

Description of the Insect.

Although the insect is a common one, and occurs in considerable numbers each year in the State of New York, yet from its seldom attracting particular attention, owing to its ordinary nocturnal habits, it appears to be known to very few persons other than entomologists. The following account of its features in its several stages may serve as a guide to its recognition.

The eggs.—They will rarely be seen by the ordinary farmer, but when met with, they may be recognized from the following characters: They are smooth, white when first laid, turning gradually to a pale straw color before hatching, about 0.023 inch in diameter, and usually deposited in masses glued together by an adhesive substance. They may be found between the leaf-sheath and the stem of grasses,—the toughest stalks in the thickest clumps being preferred for their place of deposit. They are also at times, laid on other herbage, on dead stems, sticks, and in other less favorable places when the moths are abundant.

The young caterpillars.—They are rarely seen and yet it is of great importance that the farmer should be able to recognize them before extensive depredations have proclaimed their true character. The recently hatched army-worms are about 0.07 of an inch (1.7 mm.) long and of a dull translucent white color. The head is brownish-black or yellowish with dark eyes. On both head and body there are minute scattering hairs. The young larvæ walk in a looping manner, as the two anterior pairs of abdominal legs are atrophied.

After the first molt the larvæ are about 0.2 of an inch (5 mm.) long. The head is a little darker in some cases and the striping seen in the full

grown caterpillars is becoming apparent. The general color of the body is yellowish-green with three, more or less well defined, rose-brown lines on each side of the body,—the lower line being the broadest and the most conspicuous. In this stage the minute black hairy tubercles of the body may be seen. The caterpillar still loops as it walks and spins a thread as it drops from a leaf when disturbed, as in the first stage. After the second molt the striping is more pronounced, though the general color is the same. The habit of looping when walking and of spinning a thread when it drops is lost: instead of the latter it curls itself up as it falls to the ground. After the third molt the caterpillars become a dull, dark green color and the head is mottled with dark brown. The striping is nearly that of the full-grown caterpillar. In the next two molts there is but little change in its markings and other features.

The full-grown caterpillar.—When full-grown or nearly full-grown, there is quite a range of coloring to be seen among a large number. Their general appearance is such that once seen they are easily recognized. The larger ones are about one inch and one-half (38 mm.) long, but associated with them are many smaller individuals, some of which are only about half the length of the largest. This range in size may be seen at the time when their ravages attract attention. They may be recognized in their latter stages by the median white line beginning at the head and extending a variable distance along the back—in some of the lighter and younger ones it may be traced the length of the body. On either side of the median white line, there is a broad brown stripe more or less distinct (in lighter individuals there may be a white mottling along this stripe), bordered laterally by a narrow one of darker brown. Next is a white line similar to the median one but more constant, and between it and the next white line there is a stripe of variable brown, sometimes mottled with white; it is usually lighter than the stripe on either side of the median white line. Next comes the stigmatal stripe which in well-marked individuals is the most striking, it being as dark as any, and below it is the white substigmatal stripe; these two are somewhat variable in color in different caterpillars. The ventral surface is a variable yellowish-green: the abdominal legs are brown at the base. The light and dark varieties of the caterpillars are represented in the two lower figures of Plate III.

The pupa.—The mahogany-brown pupa is about three-fourths of an inch (18 to 20 mm.) long. It is rather stout and on the anal extremity there is a pair of slightly converging spines, and on each side of these, two fine curled hooks. The spiracles are nearly black.

The imago.—The moth is a plain appearing reddish-gray or fawn colored insect with a spread of wing, averaging about one inch and one-half. The fore-wing has two large ill-defined spots of a slightly lighter color anterior to its center; behind the outer one, is the small characteristic white spot indistinctly bordered with black. There is a faintly indicated oblique line from the apex to near the outer third of the hind margin of the wing, of which only the portion of the line near the apex is continuous, the remainder being represented by dots. The tips of the veins are usually indicated by black, and the whole surface of the wing is slightly and variably specked with the same. The outer portions of the hind wing is a uniform dark gray; the basal portion lighter. Fringe with a grayish, silvery luster. Beneath, the wings are a silvery gray. The moth is shown in Plate III, figures *a*, *b* and *c*.

Life-history and Habits.

The life-history and habits of this, at times, very destructive insect are of the utmost importance in preventing its ravages or in checking it after the destructive work of the larvæ becomes apparent. Most, if not all, of its demonstrations are characterized by the sudden discovery of large numbers of caterpillars rapidly destroying the crops, and usually when thus discovered, it is too late to prevent serious loss. The number of broods in a year is controlled largely by the length of the season in connection with an abundance of suitable food. In the North there are but two or three generations in a year, while in the South, it is stated that as many as six may occur. The insect may pass the winter, in the northern portion of its range, either as moths or larvæ, and possibly in the pupal stage; in the southern portion, it may exceptionally hibernate in the egg.

The habits of the imago.—The moths may be seen on the wing in the early evening hours or during the day in cloudy weather. The flight is usually near the ground and is accompanied by a low humming sound, similar to, but less intense than that of the hawk-moths; it is strong, irregular, and plunging. They are probably capable of long-sustained flights, as on one occasion when they were swarming in houses in the vicinity of the Atlantic coast, fishermen reported a great cloud of the moths over their boat out at sea.

Their food is quite varied: they have been taken on the blossoms of apple-trees, on honeysuckle, soap-wort (*Saponaria officinalis*), and yucca. In August of the present year they were attracted in great numbers to the red berries of the Tartarian honeysuckle (*Lonicera Tartarica*), in Washington park, Albany, upon which they fed, either by puncturing

or abrading them, as many of the berries were more or less bruised, and but few other insects were seen around them. It is quite probable that they are drawn to the nectar of flowers and the juices of various fruits. They are also attracted by plant-lice, probably for the purpose of imbibing the honey-dew excreted by these insects. Mr. Van Duzee records an instance (*loc. cit.*) of the moths swarming around an apple-tree badly infested with *Aphis mali*. Dr. Smith, in his Report for 1896, p. 450, mentions their occurrence in large numbers among the plant-lice on melon-vines. The moths seem to require an unusual amount of food, the reason of which may be that the eggs are not developed in recently issued females: no traces of them were found in a number of females dissected during this year.

Oviposition is said not to begin until a week or more after the moth has emerged, and it is believed to continue for the remainder of the adult existence, which may amount to several weeks. No eggs were obtained the past season from females which were either reared from caterpillars or from pupæ collected in the field, although moths taken at the Tartarian honeysuckle berries oviposited within a few days. The eggs are ordinarily deposited by preference in thick tufts of grass, especially such as have been stimulated in growth by the droppings of cattle in pastures, and in other similar localities. The oldest and toughest stalks are selected, and on these the eggs are thrust down between the sheath and the stalk and usually secured in place by a gummy secretion. Early in the season the moth is known to deposit apparently by preference in cut straw of old stacks, in hay ricks, and even in old fodder stacks of corn stalks. Its eggs may also be found in bits of corn stalks on the surface of the ground, and in the preceding year's stalks of grasses; or, the moth may oviposit in the spring in young grain, and at times, on the leaves of plants upon which the larvæ rarely feed, as on clover. The eggs are most frequently deposited late in the afternoon and during the earlier hours of the night, in strings of fifteen to twenty ordinarily, although batches of nearly a hundred, in from three to eight rows on a single stalk have been found. In breeding cages the eggs have been placed in masses of over a hundred, arranged in several rows between two sticks. The first moth dissected by Dr. Riley was found to contain upwards of 200 eggs, but later dissections resulted in finding 562 and 737 eggs respectively, which is probably nearer the average number.

Habits of the larvæ.—The eggs hatch in from eight to ten days. The young larvæ remain in hiding most of the time, feeding only during cloudy weather and at night. They shelter themselves in the folds of leaves, in

stubble, and even under the bark of adjacent posts for the first few days, or they may simply rest at full length along a well-shaded leaf. Their habit of dropping upon the slightest disturbance, renders their detection more difficult. During their first week, they eat only of the lower epidermis of the leaf in a manner similar to young Crambid larvæ — at least such was the habit of those reared the past season. In about a week they begin to eat holes in the sides of the leaves, and thereafter their appetites develop rapidly. There is considerable difference in the growth of the larvæ even from the same mass of eggs and under almost identical conditions, some being nearly a molt in advance of the others. This same difference is the more marked in caterpillars growing under natural conditions in the field, where variation is the rule and not the exception. The abundance and the condition of the food has a great influence on the rapidity of their growth, for if abundant and succulent it will be most rapid, while if dry it will be much slower. The parent moth apparently seeks to give her offspring the best conditions when she searches out the thickest and greenest herbage in which to place her eggs, and in most cases it is in just such spots that the destructive armies have their origin. They are really centers of distribution, and should be so regarded.

Migrations.—The earlier stages of the army-worm escape observation in most instances, and it is only when they are unusually abundant and after they have become half-grown that they attract attention. It is not until then, and after all the food has been devoured in their immediate vicinity, that they are noticed. The caterpillars are now forced to move elsewhere or starve. In ordinary years this rarely occurs, for they are not sufficiently abundant to work any serious injury, unless it be a slight thinning of the crop. It will be seen, therefore, that the "marching" habit is abnormal, although it may be the one most familiar to many. The uniform movement of the caterpillars in the same direction may be explained as the most natural, because it is the easiest when they are abundant, for otherwise their opposing motions would be a hindrance to one another. The determination of the direction of the march is probably the result of chance to a great extent, and is governed largely by the direction taken by the first to move, although some are inclined to think that the insects march more frequently toward a certain point of the compass, and others believe that they scent a favorite crop in the distance. The food of the caterpillars is so abundant that it hardly seems necessary to suppose that they are guided to it by a special sense, and it is equally difficult to see how a knowledge of the points of the compass would aid materially in such a search.

In their marches the caterpillars move, so far as possible, in a nearly straight line, turning aside for nothing that can be surmounted. It has even been stated that they will climb the trunk of a tree to the lowest fork and descend on the other side. A number of instances have been reported in which they marched over buildings, where in some instances they were so thick as to cover the sides of the structure. They can not bear the hot sun, and so far as possible, avoid it in their travels, and after crossing a sunny field they may be seen resting in the shade of fences or shrubbery that may offer the desired relief. Water does not deter them. The rear ones push forward over the bridge formed by the dead and dying of the vanguard: if it be a large running stream they perish by the millions. Their march is not a very rapid one; it has been computed at, ordinarily, the rate of 30 yards an hour.

Occasionally it happens, that the army-worm will migrate from the fields for the sole purpose of finding a suitable place for pupation, as in instances when there is abundant food in a grain field, but the soil is too hard for the caterpillars to bury in easily. This was noticed to a limited extent in the outskirts of Albany, where after partly stripping the leaves in an oat field, the caterpillars in migrating, inflicted little damage to a corn and grass field adjacent, but later their pupæ were found in abundance under the leaves and grasses beside the outer fence—35 being counted within an area of about two square feet.

Associates.—It is not an uncommon occurrence, that cut-worms are associated with the army-worm in its ravages. In the 11th Illinois Report, Mr. Coquillett records the presence of *Agrotis c-nigrum* in an army-worm attack, in the proportion of one cut-worm to eight or ten army-worms, while Dr. Howard found the proportion to be as high as one to five.* A single example of *Agrotis ypsilon*, was detected in a lot of over 100 army-worms received from Ghent, N. Y., early in October of the past year.

Food of the Caterpillars.

The favorite food of the army-worm is undoubtedly, the green succulent leaves of a luxuriant growth of some member of the true grass family, the *Gramineæ*. In fields of small grain, the greener leaves are quickly stripped from the stalk, and, if the stem is not too hard, the heads will frequently be eaten off and fall to the ground. Occasionally, the heads are partly eaten after they have been lopped off, but more frequently they are left untouched by the caterpillars. This wanton habit of the army-worm, increases its harmfulness in grain fields, without any

*In 3rd Rept. U. S. Entomological Commission 1883, p. 135.

commensurate gain to itself. Of the cultivated crops, wheat and oats appear to be the favorites. Corn is perhaps less frequently attacked, for the reason that its method of cultivation is such as to discourage the insect breeding in fields of it, while, as shown before, the attack of any field after marching has begun is determined largely by chance. Rye and barley are eaten, but apparently with less relish. When pressed by hunger, the army-worm can readily accommodate itself to circumstances and devour many plants differing widely in character from its chosen forage. The most important of these are: flax, clover, beans, peas, strawberry, leaves of fruit-trees, watermelon, cucumber, rag-weed (*Ambrosia artemisiifolia*), cranberry, wild Solanum, capsicum pepper, Amaranthus, asparagus, and onions. There are a number of other plants upon which the caterpillars have been successfully reared, and upon which they would probably feed in nature, if nothing else was convenient to them. Some of the food-plants mentioned above, have been reported as not eaten by the army-worm, while others report them as occasionally injured. It is probable that the caterpillars are guided largely by the demands of nature for sustenance, and in proportion to their necessity do they turn to whatever is at hand.

Pupation.

Many accounts of the army-worm record its sudden disappearance, "as if by magic." A field may be swarming with its hosts, and in a day or two none will be seen. But if one will examine the loose surface soil in a recently infested field or will look beneath the brush and dried grass on its borders, the mahogany-brown pupæ will readily be found. The caterpillars have simply entered the ground for pupation and will soon reappear as moths. The duration of the pupa state is governed largely by the temperature; in July of last year, it was about 20 days in this State, while in September it was lengthened to about 30.

Number of Generations.

In this State there were three broods the past season, which is probably the usual number. No observations were made on the first generation, therefore it is safe to assume that it was quite a limited one. It was the second that attracted attention throughout the State during the first two weeks of July. They completed their growth and pupated before the end of the month. The first of August moths were emerging, and by the 7th, no pupæ could be found in searching in what had been a badly infested field, although pupal shells were abundant. Numbers of moths were seen in Washington Park, in Albany, on August 14th and 17th, but a week thereafter they had all disappeared.

On September 26th, larvæ of the third brood were reported as committing serious ravages on the farm of Jacob Harder, Ghent, N. Y., where the second brood had been destructive in July.* A number of the larvæ were sent to my office, of which the last buried for pupation, about October 12th. Moths from these began to emerge the 27th, and continued to do so until November 21st. During this time, 77 moths made their appearance, coming out most abundantly from November 2nd to the 10th. The appearance of the adults so late in the season, renders it quite probable that they hibernate in the imago state in Albany, as has been observed at Cambridge, Mass., although a portion of the brood may also winter as pupæ. According to Dr. Howard, the insect may exceptionally pass the winter in the egg in some of the Southern States. It will be seen that these observations on the life-history of this insect agree quite closely with those of Prof. Weed, at Durham, New Hampshire; and other observations render it probable that there are ordinarily three broods each year in the other New England States, with the exception of northern Maine. In New Jersey, Dr. Smith reports three generations as the normal number in the northern portion of the State, while in the southern part a fourth is by no means unusual.

Summary of Life-history.

The life-history of the army-worm, so far as known in this State and the vicinity, may be briefly summarized as follows: Overwintered moths or recently emerged ones, which may have hibernated as larvæ, or possibly pupæ, deposit eggs early in the spring, and from them the first brood of larvæ develop. From their comparatively small number, they rarely prove very destructive and are consequently unnoticed. They mature, pupate, and the adults emerge and lay the eggs from which is produced the second brood. These in turn become nearly full-grown early in July, and we have the brood usually destructive, and the one which committed such widespread ravages in the State the present year. Pupation occurs in July and the moths emerge early in August. They deposit eggs the latter part of the month, and early in September the third brood makes its appearance and by the latter part of the month they are full-grown. This is the brood which was quite destructive the present season, at Ghent, N. Y., pupating the last of September, or early in October,—the moths emerging the last of October and into November, and most probably passing the winter in the imago state.

*They were also reported as destructive on several farms in Berlin, Bolton, Northboro, and other places in Worcester county, Mass., during the last of the month.

Natural Agents Controlling the Army-worm.

The inquiries are frequently made: Where do the army-worms come from? Will they be abundant next year? The first question has already been answered, but the answer to the second may not be so readily given. The comparative abundance or scarcity of this insect, as well as of others, from year to year is controlled by natural causes. The most prominent of these are the relative abundance and quality of its food, the favorable or adverse climatic conditions, and the number and activity of its natural enemies. Temperature and moisture have an important bearing on the production of its food-plants, and all know that without an amply supply of proper food, the caterpillars would die while young or immature, and no serious injury to crops would result from their presence. Weather conditions have also marked effect upon insect growth and development. Cold and wet serve to impair lepidopterous life, and when such prevails while the insect is in its tender larval stages, great mortality is the result. Hibernation is a severe ordeal for many insects, and alternate freezings and thawings, to which they may be subjected, may terminate many insect lives. It is only when the climatic conditions in connection with other controlling causes are favorable to the rapid growth and multiplication of the insect, that the ravages of the army-worm reach the ruinous extent of the present year. Such combinations can not be predicted. They very rarely occur in consecutive years. The theory has been advanced, that a dry season followed by a wet one, is likely to be an army-worm year, and it is apparently borne out by records made. But the attempt to predict the abundance of the army-worm solely from the amount of rain-fall for the year, ignores the important part that the predaceous and parasitic enemies of this insect have in its control.

The army-worm is also subject to a deadly bacterial disease, which may be fatal to large numbers. In the western portion of the State, 25 per cent. were killed by it in some localities (Lowe, *loc cit.*, p. 128). Unfortunately, the disease is only effective, it is believed, under certain conditions, and these are rarely favorable in nature to any extended action, or even to artificial propagation.

Predaceous Enemies.

Fortunately for the farmer, the army-worm has a large number of foes that prey upon it. Swine are said to eat them greedily, and to prefer them to corn. Shrews, skunks, and weasels, are reported as consuming large numbers. Domestic fowls, especially ducks and geese, are valuable

allies in fighting an army of these caterpillars. Most, if not all, of the insectivorous birds feed readily on them. Some of the most serviceable are the bobolink, blackbird, robin, and meadow lark. The English sparrow should be credited with feeding on the army-worm to a certain extent. Others that have been observed are the king-bird, blue-jay, golden-winged woodpecker, phoebe, cow-bird, Baltimore oriole, chipping sparrow, chickadee, and quail. Frogs and toads devour them with a relish, the remains of as many as fifty-five having been found in the stomach of one garden toad.

A number of predaceous insects are known to prey on the caterpillars. The more common and perhaps the most important belong to the family of *Carabidae*, or ground-beetles, which may be found under stones and other shelters in the fields. One of the most efficient of these in this State, is the fiery ground-beetle, *Calosoma calidum* (Fabr.). This fine beetle may be easily recognized by the six rows of large coppery-red, or golden spots on the wing-covers. Both the beetle and its larva, are fierce enemies of the ordinary cut-worms, as well as army-worms. In the Southern States, the allied *Calosoma scrutator* (Fabr.), with its bright green wing-covers margined with a resplendent coppery-red, is an equally deadly enemy of the army-worm. Two other species of this genus, *C. externum* (Say) and *C. Wilcoxi* Lec., have also been observed preying on the caterpillars. A common tiger-beetle in this State, *Cicindela repanda* Dej., is another of its deadly foes. Besides these, the following ground-beetles have been observed preying on the caterpillars: *Elaphrus ruscarius* Say, *Pasimachus elongatus* Lec., *Pterostichus sculptus* Lec., *Amara angustata* Say, *Platynus sinuatus* (Dej.), *Cratacanthus dubius* (Beauv.), *Harpalus caliginosus* (Fabr.), *H. Pennsylvanicus* (DeGeer), *Selenophorus pedicularius* (Dej.), and *Anisodactylus rusticus* (Say). A large southern bug, *Metapodius femoratus* (Fabr.), has been observed in large numbers sucking the juices from the army-worms. This rapacious insect, it is said, has the peculiar habit of hanging the caterpillar skins after it has sucked them dry, in the crotches of May-weed in the infested field.

The large ground spiders are said to prey freely on the army-worms, and the spinning forms often entrap the moths in their webs for their food.

Parasites.

The army-worm is subject to the attacks of a large number of true parasites, several of which are very destructive to the caterpillars, and may be classed with natural enemies, having an important part in keeping the insect from becoming excessively abundant. The most important of these

are the red-tailed Tachina-fly, *Winthemia 4-pustulata* (Fabr.), formerly known as *Nemoræa leucaniæ* (Kirk.), but which has recently been found identical with this European species; and the yellow-tailed Tachina-fly, which was described as *Exorista flavicauda* by Riley, but it has recently been pronounced identical with *Belvoisia unifasciata* Desv., by Mr. Coquillett. These two flies are frequently seen in numbers in fields where the army-worm is numerous. They are often so abundant that their buzzing reminds one of a swarm of bees. Their conspicuous white eggs are usually deposited on the head or thoracic segments of the caterpillar, where they can not be reached by the jaws of the victim for their removal; occasionally they may be found on the anterior abdominal segments. As many as eighteen eggs have been counted on a single caterpillar, but the average is about five. The eggs soon hatch and the young maggots make their way into the body of their host, where they revel in its juices and eventually cause its death. This Tachina oviposition is not, however, necessarily fatal to the larvæ, for if it occurs at near the molting, the eggs may be cast with the skin before the time for their hatching. The proportion of caterpillars parasitized in the vicinity of Albany, was observed to be quite small, probably about 8 per cent., but in the central and western portions of the State, the eggs of these parasites were comparatively abundant.

The following flies have been reared from the army-worm: *Cislogaster immaculata* Mcq., *Ocyptera euchenor* Wlk., *Miltogramma argentifrons* Twns., *Myophasia ænea* Wied., *Sarcophaga heliciis* Twns., *Sarcophaga ædipodinis* Twns., *Sarcophaga* (two species), *Lucilia casar* (Linn.). It is more than probable that some of these are not true parasites.

Next in importance perhaps to the Tachina flies as parasites, are the minute four-winged Microgasters, several species of which are parasitic on the army-worm. The most abundant of these is the military Microgaster, *Apanteles militaris* (Walsh), which is usually present, wherever the army-worm abounds. From sixty-two to ninety-six of its larvæ have been found in the body of one caterpillar. Its whitish cocoons are often attached to the grass, or to the under side of sticks, stones, etc., in small masses surrounded by more or less loose silk. *Apanteles limenitidis* (Riley) is another species parasitic on the army-worm. Unfortunately, these two beneficial insects are in turn parasitized by a Chalcid, *Glyphe viridascens* Walsh, and by a small Ichneumonid, *Mesochorus vitreus* Walsh. *Haltichella perpulchra* (Walsh), is also a parasite of one of the Microgasters above-named. Another smaller parasite of the army-worm is the wingless *Pezomachus minimus* Walsh, which in turn has its Chalcid

parasite, *Smicra albifrons* (Walsh). *Ophion purgatum* Say, is one of its larger parasites, and in some localities it is often quite abundant. In Minnesota its cocoons were numerous in the infested fields the past year. The following species are also recorded among its parasites: *Ichneumon leucaniæ* Fitch and *I. flavizonatus* Cress., *Hemiteles laticinctus* Riley MS., *Stibetes gentilis* Cress., *Limneria oxylus* Cress., *Mesochorus scitulus* Cress., and *Rhogas terminalis* Cress. *Bassus scutellaris* Cress. was observed apparently ovipositing on the army-worm.

Preventives and Remedies.

When a field has become badly infested with half-grown army-worms, little can be done to save the crop beyond cutting at once what remains and promptly removing it from the field. In order to prevent injuries by this insect, the intelligent farmer will, so far as possible, combat it along two lines. In the first place he will endeavor to prevent it breeding in numbers in his fields by so cultivating and caring for his crops as to offer the least favorable conditions for hibernation, oviposition, and the subsequent growth and development of the caterpillars. Secondly he will make effort to protect and favor its natural enemies.

Destruction of hibernating forms.—Whether the insect passes the winter as a moth or a caterpillar is not so very important to the farmer, provided he can destroy them in either state. In nature both the moths and caterpillars shelter themselves largely under thick grass and rubbish as winter approaches. The burning over of such places late in the autumn or preferably in the early spring must result in the destruction of large numbers of the insects. This measure would at the same time kill many other injurious insects hibernating in such places, and also, unfortunately, some beneficial forms. It is believed, however, that the benefit resulting from the burning would far outweigh the loss caused by the destruction of our insect friends.

Proper cultivation.—It has been shown in the preceding pages that the moth exhibits a decided preference for thick herbage of some kind when about to deposit her eggs, and that such areas are distributing centers to other portions of the infested fields. Many such places are to be found in the neglected weeds and grasses springing up beside fences, or they may occur in the middle of fields, as the result of unequal manuring. The good farmer by keeping his entire fields clean, and avoiding uneven manuring, will not offer conditions that invite oviposition.

Encouraging natural enemies.— Among the most beneficial may be counted many of our insectivorous birds. They have repeatedly been observed feeding on the army-worms in badly infested fields. If the grain fields are not sown too thickly, not only is a better crop secured, but the birds, having more wing room in the grain, will feed to a much larger extent on the caterpillars. Unfortunately, little can be done toward encouraging the insect enemies of the army-worm beyond protecting them so far as possible, and giving them the favorable conditions that may attract them.

Watching for indications.— The measures given above are not to be depended upon entirely, even though carried out to the letter. They should be supplemented by watchfulness. If the army-worm commences its operations in a field in unusual abundance, it is of the utmost importance that its presence should be known at once. The discovery is usually made, and advice sought in the matter, when it is too late to save more than a scanty half or less of the crop attacked. It is not a difficult task to discover the caterpillars some days before they are usually seen, and no man should begrudge the time devoted to the search. The thickest portion of a field should be examined for their small black or brown droppings, and the condition of the lower leaves of the grass or grain noticed. If the leaves are injured or absent, something has been eating them. The enemy may be found hidden under loose shelter of any kind on the ground or just below the surface, or when very small, upon the plants. If they are discovered before serious injury has been done to the crop, it is comparatively easy to decide whether or not to cut it at once. If the field is thickly infested, they will destroy the crop unless it is taken from them.

The commencement of an army-worm attack, as above noted, will rarely be detected. It is only when their operations can no longer be hidden from ordinary observation that alarm is excited, and the necessity of active measures for arresting their destructive marches from field to field becomes apparent. Some of the following measures will then be found of service :

Lime, dust, etc.— If the army-worms are numerous in a field—at an early stage in their operations, it would probably be wise to cut the crop at once and save what is left of it, although air-slaked lime, land plaster, or even road dust freely distributed over the vegetation when it is wet with dew or rain, would render it unpalatable to the caterpillars and compel them to seek other food.

Poisoned bran mash.—This was used in different localities in the State the present year with considerable success in infested fields. It was reported in several instances that the caterpillars would even leave the corn upon which they were feeding and descend to the ground for the purpose of eating the attractive bait. Large numbers were killed by its use and the crops were protected to a considerable extent. The recipe for its preparation is as follows: 35 lbs. wheat bran, 1 gallon of molasses and 1 lb. Paris green mixed to a proper consistency with hot water. It should be distributed just before nightfall, as then the caterpillars are usually beginning their feeding.

Ditching.—This method is of value only in keeping the army-worms out of fields comparatively free from them, and it is quite effective if properly conducted. The ditch may be made by plowing a rather deep furrow with its perpendicular side towards the field to be protected. At intervals in the ditch of fifteen or twenty feet, holes of about two feet in depth should be made (easily done with a post-hole auger) into which the caterpillars, unable to climb the wall, will fall and die. As often as the holes become filled they may be easily killed and removed. The furrow or ditch should have the perpendicular side clear of all weeds, roots, and other matter that might aid in climbing out. An improvement on the single furrow has been recommended by a resident of Dutchess county. The first furrow is turned towards the crop to be protected, and then returning with the plow in the furrow, the perpendicular wall is made next to the crop. By this means soft crumbly earth is obtained on both sides of the furrow, which will be more difficult for a caterpillar to climb than a smooth firm surface. If the one ditch should by any means prove insufficient, a second, a short distance in advance of the other, could be made.

Bands of tar.—Broad bands of tar have been used in some of the Western states in lieu of ditches, but, as they require to be renewed as often as they become bridged or the tar hardened, this method would doubtless be more expensive than the ditching. Another method is the tarring of boards and setting them up on edge as barriers. This is more effectual than bands of tar, but it is more expensive.

Poisoned strips.—A field may often be protected by spraying an exposed strip heavily with Paris green and water, or by sprinkling it with land plaster and Paris green. In either case it should be heavily poisoned. The poisoned portion of the crop should be carefully destroyed after it has served its purpose, in order to prevent the chance of its being eaten by stock.

Spraying with kerosene.—A safer way and just as effectual as poisoning strips with Paris green, would be found in spraying a strip with kerosene or a strong kerosene emulsion; but repeated applications — as many possibly as six in a day might be required to keep the traveling army in check.

Dragging the rope.—This method has been recommended in former years, but its efficacy may be questioned. It is simply drawing a long rope, held by a man at each end, over the infested field. The grass or grain bows under the weight of the rope and, as it springs back, the caterpillars drop to the ground where they remain for some time. It would need frequent repetition and would prove effective only when the field is not badly infested.

As means of protection from the ravages of this destructive pest, a number of methods have been named from which selection may be made of those which seem the most practicable for use in the localities or fields invaded. It not infrequently occurs that a remedy for some insect depredation which fully accomplishes its purpose under certain soil and other conditions, will in places where the conditions are of a markedly different character, prove to be of no value whatever.

Steganoptycha Claypoliana (Riley).

A New Maple-Tree Insect.

(Ord. LEPIDOPTERA: Fam. TORTRICIDÆ.)

- RILEY: in Amer. Nat., xv, 1881, pp. 1009-1010 (compared to *Proteoteras asculana*); in id., xvi, 1882, pp. 913-914 (the name of *Proteoteras Claypoliana* proposed); the same in Sci. n. Amer., Suppl., No. 363, Dec. 16, 1882, p. 5797; in Amer. Nat., xvii, 1883, p. 978 (compared with *Proteoteras asculana*, and referred to *Steganoptycha*); reprint of same in Papilio, iii, 1883, p. 191.
- CLAYPOLE: in Proc. Amer. Assoc. Adv. Sci. for 1881, 1882, pp. 269-270 (abstract of life-history; erroneously referred to *Sericoris instrutana*); in Psyche, iii, 1882, pp. 364-367 (notes on life-history).
- SMITH: List Lepidopt. Bor. Amer., 1891, p. 93, No. 4976
- LINTNER: in Country Gentleman, lx, 1895, pp. 484-485 (recorded on maple, life-history); 11th Rept. Ins. N. Y., 1896, pp. 278, 285 (abstract of preceding, mention).

The interesting insect named above is very unobtrusive in its habits, if one may judge from the few notices that have appeared of it. There is no record of its having been observed in the field by more than

four different individuals. Although it appears never to have been so abundant as to cause much damage, yet it is most probable that careful observation would reveal its presence in many hitherto unsuspected localities.

Burrowing in the Petioles of Maple Leaves.

The following communication from a correspondent of the *Country Gentleman*, gives a brief account of the operations of this insect when for the first time detected upon the maple (in 1895), so far as any record is to be found:

I enclose leaves of sugar maple, the petioles of which are infested with a minute larva. My attention was first attracted by numerous green and half withered leaves lying on the ground with only a short portion of the petiole attached, which led me to look for the remaining portion; this I found attached to the tree, with a small channel extending towards its base. At the end of this was the larva. About a year ago I passed some rows of sugar maples appearing as mine do now, and I attributed the cause to a fungoid blight, but without examination. W. T.

Concordville, Pa.

When fallen maple leaves have been noticed during the early part of the year, it has usually been ascribed either to frost or some fungus attack. But in this instance, the leaves affected in the manner stated happening to come under the eye of a close observer, the cause was looked for, and careful search disclosed it in a small caterpillar burrowing within the portion of the leaf-stalk remaining upon the tree.*

From the examples of the leaves and separate portions of the stems or petioles sent, the operations of the caterpillars have been followed and its species determined. It proves to be the larva of a small Tortricid moth which has received the name of *Steganoptycha Claypoleiana* — after Prof. Claypole, who had studied and made first publication of the insect when working in the leaf-stalk of the horse-chestnut, in Ohio.

Confused with a Closely Allied Insect.

This species was confused at first with a closely allied form, *Proteoteras asculana* Riley, reared from larvæ found boring the leaf-stalks and the tender terminal twigs of the buckeye and maple in Missouri, and was referred to this form. A little later, it was regarded and described by Prof. Riley as a distinct species of the genus. Finally it was referred to *Steganoptycha* by Prof. Fernald.

* Mr. Zabriskie has placed on record an injury to the petioles of maples at Flatbush, L. I., which is most probably the work of this insect (see *Journ. N. Y. Entomolog. Soc.* iii, 1895, p. 144).

It may be distinguished from *P. æsculana* by the following characters, according to its describer:

Claypoliana lacks the notch in posterior borders of primaries, the tufts of raised scales on the discs of same, and the peculiar tuft or pencil of hairs on the upper surface of secondaries in the male, between the margin and the costal vein. It is a shorter, broader-winged species; the ocellate spot is less distinctly relieved, the median oblique band more broken, the basal-costal portion paler and contrasted along the median vein with a dark shade which may be almost black, and which broadens posteriorly till near the middle of wing, where it is abruptly relieved by a pale space obliquing basally.

Description of Several Stages.

The moth has been characterized briefly by Prof. Claypole as follows: "It was small, with a peculiar hopping flight, the fore wing mottled black and white, and the hind wing more uniform in color, dusky, and slightly spotted with black near the tip."

The light red pupa was inclosed in a rolled up leaf lined inside with silk. Eight abdominal segments were visible.

A larva examined May 13th was two-fifths of an inch long with a yellow head and yellowish body. The minute granulations of the skin are smooth,—not pointed as in *P. æsculana*. The same general appearance was retained until pupation, except that it became a little darker.

Operations and Life-History.

In the leaf-stalks of the buckeye, *Æsculus glabra*, Prof. Claypole found the insect during the early part of May. About the 10th, they deserted the petioles through the holes by which they had entered, and betook themselves to the fading leaves. Upon the dying foliage they completed their growth naturally to all appearances. This food-habit is apparently normal, as no nibbled green leaves were found on the infested trees after the larvæ had deserted the leaf-stalks. Pupation occurs the latter part of May,—the first pupa being found on the 25th. The moth appears about fifteen days later. Prof. Claypole was not able to ascertain the place and manner of the deposit of its eggs, the number of broods, or the form in which it hibernates.

The work of this insect in the maple leaves coincides closely with that in the buckeye. The egg of the parent moth appears to be placed at the base of the leaf,—perhaps at the divarication of the ribs. As the young larva tunnels the petiole, the portion traversed by it shrivels, blackens, dries, and is broken off by the weight of the leaf. The larva con-

tinues its course downward, and on the stalks examined could usually be found at the end of a freshly cut channel of about one-half inch in length. In several instances a small opening was visible in the petiole through which the larva had emerged to undergo its transformations within a fold of a shriveling leaf, or possibly among the leaves on the ground.

Its Habits Compared with Those of *Proteoteras æsculana*.

These closely allied insects have different habits that are of value in distinguishing the species. *S. Claypoliana* bores the leaf-stalk of both the buckeye and maple and very rarely the twigs of the former. It is also known to feed on the blossoms of the buckeye. The larva of *P. æsculana* bores the slender terminal twigs of both these trees and often forms a swelling or pseudo-gall—the former insect never produces a gall. *P. æsculana* bores the petioles and terminal twigs for a distance of from one-half an inch to two inches, and lives in the gall, apparently through most of its larval existence. It feeds also on the winged seeds of the maple. *S. Claypoliana*, on the contrary, seldom or never bores along the leaf-stem more than half an inch, very rarely enters the terminal twigs, and lives in the rolled up leaf after the first two or three days.

Remedies.

The mining within the leaf-stalk by this insect has caused many leaves of the buckeye and maple to fall in certain localities, yet it is not probable that it will multiply and spread to such an extent as to become a serious pest, although in one of the maple twigs sent, four of the five leaves that it bore contained larvæ within the petioles.

Should further observations show that many of the fallen leaves carry with them to the ground the infested portion of the petiole or the insect within the folds of the leaf, as they appear to do in some instances, then it would be of service to collect and burn the leaves as soon as they fall, and before the larva has left them.

Oxyptilus periscelidaetylus (Fitch).*The Gartered Plume-Moth.*

(Ord. LEPIDOPTERA: Fam. PTEROPHORIDÆ.)

- FITCH: in Trans. N. Y. State Agricul. Soc. for 1854, 1855, pp. 843-847 (larva, pupa, imago, described, habits; as *Pterophorus*); the same in 1st-2d Rept. Ins. N. Y., 1856, pp. 139-143.
- PACKARD: Guide Study Ins., 1869, pp. 356-357, Pl. 8, figs. 23, 23a, 23b (brief account, as *Pterophorus*); Entomol. for Beginn., 1888, p. 150, fig. 179 (as *Pterophorus*).
- RILEY: 1st Ann. Rept. Ins. Mo., 1869, pp. 137-138, Pl. II, figs. 15, 16 (common in Mo., description; as *Pterophorus*); in Amer. Entomol.-Bot. ii, 1870, pp. 234-235, fig. 148 (injuries, life-history; as *Pterophorus*); the same in 3d Ann. Rept. Ins. Mo., 1871, pp. 65-68, fig. 27; Bull. 31 Divis. Entomol., U. S. Dept. Agricul., 1893, p. 32 (reference).
- SAUNDERS: in 1st Ann. Rept. Entomolog. Soc. Ont., 1871, pp. 102-103, fig. 42 (life-history, habits; as *Pterophorus*); the same in Rept. Fruit Growers' Assoc. of Ont. for 1870, 1871; in 2d Ann. Rept. Entomolog. Soc. Ont., 1872, p. 18, fig. 11 (troubes in Ontario, as *Pterophorus*); in Canad. Entomol., v, 1873, pp. 99-100, fig. 15 (description, life-history; as *Pterophorus*); Ins. Inj. Fruits, 1883, 1889, pp. 268-270, fig. 278 (general account).
- PERKINS: in 5th Rept. Vt. Bd. Agricul., 1878, pp. 274-275, fig. 22 (brief account, as *Pterophorus*).
- FRENCH: in 7th Rept. Ins. Ill., 1878, p. 268 (brief notice, as *Pterophorus*).
- DIMMOCK: in Psyche, iii, 1882, p. 390 (liability to parasitism), p. 403 (bibliography).
- KELLCOTT: in Bull. Buff. Soc. Nat. Sci., Jan., 1882, separate, p. 1 (mention).
- COOKE: Inj. Ins. Orch.-Vin., 1883, pp. 191-192, fig. 177 (brief account, as *Pterophorus*).
- FERNALD: in Kingsley's Stand. Nat. Hist., ii, Crust. and Ins., 1884, p. 437 (brief account); Bull. 12 Hatch Expt. Stat. Mass. Agricul. Coll., 1891, p. 32, fig. 26 (brief account).
- SMITH: in 10th Ann. Rept. N. J. State Agricul. Expt. Stat. for 1889, 1890, pp. 288-290, fig. 16 (brief account of, in N. J.); Cat. Ins. N. J., 1890, p. 359 (common); List. Lepidopt. Bor. Amer., 1891, p. 88, no. 4594; Econom. Entomol., 1896, pp. 318-319, fig. 366 (brief account).
- LINTNER: in Country Gent., lvi, 1891, p. 497 (general notice); 8th Rept. Ins. N. Y., 1893, p. 284 (abstract of preceding), p. 297 (reference); 10th do., 1895, p. 516 (reference).
- RILEY-HOWARD: in Insect Life, iii, 1891, pp. 469-470 (brief mention as *Pterophorus*, one annual brood).
- BRUNER: in Rept. Nebr. State Hort. Soc. for 1895, pp. 72, 147-148, fig. 77 (brief account, after Saunders).
- COMSTOCKS: Man. Study Insects, 1895, p. 238, fig. 284 (brief account).
- DYAR: in Psyche, vii, 1895, p. 253, fig. 4 (larval tubercles, setæ).

Among the many insects that prey upon the grapevine, this, in the winged form, notwithstanding its small size, is one of the prettiest and most peculiarly formed of the many species that have the vine for their food-plant. It is not ordinarily very destructive, although widely distributed and more or less injurious from year to year. The present season, however, State Botanist Peck, found it in unusual abundance in his garden at Menands, N. Y., necessitating his going over the vines and destroying the larvæ in the young tips (by pinching with the thumb and forefinger), six times during the season, whereas in former years, only two inspections were needed to keep them under control.

This species was unusually destructive in Westchester county, N. Y., in 1891, as appears from the following letter to the *Country Gentleman* :

I inclose bud and leaf of grapevine, in which you will find a small white hairy worm, which in its first stage appears to be black or brownish, and has the habit of spinning a web and gluing the budding leaves together. It is a voracious feeder, and soon destroys the leaves of the vines and young grapes. To-day, I sprayed the vines with whale oil soap suds, and if this is not effective in destroying the pests, I will try Paris green. Perhaps, Dr. Lintner can give the name, and suggest some good way to destroy this enemy of the grape.

D. J. G.

The insect was readily identified as the gartered plume-moth, *Oxyptilus periscelidactylus* (Fitch), and reply was made giving its general family characters, habits, and distribution, together with the best remedies.

Characters of the Family.

This moth and its closely related species, comprising the small family of *Pterophoridae*, are easily distinguished from all others, by their wings being split into two or more long narrow lobes. From this peculiar wing-structure, Latreille, many years ago, termed them *Fissipennes*, or Split-wings. The borders of the wings are densely ciliated, the hind margin of the fore-wings, and the fore and hind margins of the lobes of the two pairs of wings have very long ciliæ. The long slender legs are provided with stout spines at the apex of the tibiæ, a single one on the fore tibia, a pair at the apex of the remaining, and the hind tibiæ with an additional pair of spines midway of their length.

Description of the Moth.

"The moth, which is shown in figures 8, 9, Pl. V, is an elegant little insect, its wings measuring, when expanded, about seven-tenths of an inch across. The fore wings are long and narrow, and cleft down the middle about half-way to their base, the posterior half of the wing having a

notch in the outer margin. Their color is a yellowish brown, with a metallic lustre, and several dull-whitish streaks and spots. The hind wings are similar in color to the anterior pair, and are divided into three lobes; the lower division is complete, extending to the base, the upper one not more than two-thirds of the distance. The outer and hind margins of the wings, as well as all the edges of their lobes, are bordered with a deep whitish fringe, sprinkled here and there with brown; the body is long and slender, and a little darker than the wings. The antennæ are moderately long and thread-like, nearly black, but beautifully dotted with white throughout their whole length. The legs are long, banded alternately with yellowish brown and white, the hind ones ornamented with two pairs of diverging spines, having at their base a garter-like tuft of long brown scales, from which feature the moth derives its name." (Saunders.)

The Pupa.

The greenish or yellowish pupa of this insect has a very peculiar form. It may be found hanging from the leaves or bark of the grape, as an irregular, ragged looking object with an inclination to the supporting surface of about 40° . The head is obliquely truncate, from which the body tapers, slightly curving dorsally to the tip (fig. 5, Pl. IV). It is ridged, angulated, and with numerous projections—the most prominent of which is the dorsal, located about midway of its length. Dr. Fitch has compared it to the dead fragments of a little scraggy twig. The pupæ vary considerably in color, being either green or some shade of brown. It is said that the green ones are found only on the green leaves and the brown on the brown bark of the twigs; in each case they harmonize so perfectly with their surroundings that it is not easy to detect them; and such was found to be the rule among a large number reared recently. The changing of the numerous larvæ to this state under such protective conditions, has frequently led to the statement that the insect had suddenly disappeared. The duration of the pupa state is usually six or eight days, but it may be prolonged to fourteen by cold or other unfavorable conditions.

The Larva.

In the early spring as the leaves of the grape begin to unfold, here and there some of them may be seen webbed together. Within these clusters of developing leaves, represented in figure 3, Pl. IV, the greenish white-haired larvæ of this insect may be found. As an aid in identification, its description by Dr. Fitch is herewith transcribed.

The larva when full grown measures about half an inch in length. It is almost cylindrical, sixteen-footed, of a very pale green color, divided into fourteen segments by rather deep wide transverse constrictions. It has two rows of elevated white spots along the back, and one along each side, each segment having one spot in each row, or four spots in all, and between the spots is a smaller white elevated dot, and another similar dot below the lower spots. From each of these elevated spots and dots white bristles of different lengths stand out in all directions. (Pl. IV, fig. 4.)

Life-history of the Insect.

There seems to be very little definite knowledge of the life-history of this insect. The larvæ may be found soon after the leaves begin to appear, and complete their growth during the last of May or early in June. Prof. Riley gives the duration of the larval existence as about three weeks. Several larvæ received from Prof. Peck the past season pupated May 25th and others June 1st. The moths emerge about the middle of June. From this time until the appearance of the caterpillars on the vines the following spring, nothing definite seems to be known of the life-history of this insect. There is but a single brood in a season, according to Dr. Fernald. Mr. Saunders is of the same opinion and he suggests that it may pass the winter in eggs deposited on the canes of the vines near the base of the bud from which the next year's branch is developed. Prof. Riley, reasoning from analogy, suggests that the insect has two annual broods and that the second hibernates in the adult form. According to Furneaux,* the late feeding *Pterophori* emerge in the autumn and hibernate as moths, but of the hibernation of the earlier appearing ones no hint is given. It is in the imago state that the second brood of the English *Agdistis bennetii* passes the winter (see Fernald *loc. cit.*). No one has reported examples of a second brood of *O. periscelidactylus*, although several careful observers have looked for them. The moths of the single-brooded *Alucita hexadactyla* emerge in England during August, and remain on the wing until October, and then hibernate. After making due allowance for the difference in climate between this country and England, it seems reasonable to suggest that our gartered plume may fly through July into August under normal conditions, and then pass into hibernation, or, as suggested by Mr. Saunders, it may winter in the egg state. There appears to be little ground for supposing the insect to be double-brooded.

Of a large number of the moths which were reared during the latter half of June—a few days after they had emerged, several were observed

**Butterflies and Moths (British)*, 1894, p. 294.

in coition. No eggs were apparently deposited by them, and in the course of about ten days the adults were all dead. As they had no proper food, this probably hastened their death and might also account for the non-production of eggs.

Earlier History and Nature of its Injuries.

The operations of the insect first came under the notice of Dr. Fitch in 1854, and at that time it seemed to him more destructive than any other grapevine-feeding species whose life-history had hitherto been given. It was reported in 1869 as very common in Missouri by Prof. Riley, and the following year it was more injurious than usual in that section. The same year it was very troublesome in Canada, according to Mr. Saunders.

The principal injury by this insect is the destruction of the unfolding leaves in the early spring, and if unmolested the young larvæ will later devour the forming blossoms.

Distribution.

The gartered plume has a wide distribution throughout Canada, the Eastern United States, and westward at least as far as Missouri. It is also known to occur in Nebraska, and California, and it will probably be found in all of the Northern and Middle States of the Union.

Parasites.

Several parasites have been reared from this insect by Dr. George Dimmock, who simply records the fact without giving the names. None were obtained by me the past season, and there is no record at hand of rearings by others. From this, it may be inferred, that the parasites of this insect are not abundant.

Remedies.

The presence of the larvæ, is readily indicated by the webbing together of the terminal leaves. The caterpillars are so sheltered within the inclosing leaves, that arsenical spraying would be of little value against them. The most practicable method of keeping the insect in check, appears to be the simple one of going over the vines a few times in the early spring and crushing the concealed caterpillars by hand within their nests, which are easily detected.

Additional Notes on *Sciara*.*

The Fungus Gnats.

(Ord. DIPTERA: Fam. MYCETOPHILIDÆ.)

A number of species of this genus were noticed in the *Tenth Report on the Injurious and Other Insects of the State of New York*, and two, believed to be new to science, were described. During the present year several other forms were received from Dr. J. B. Smith, of the New Jersey Agricultural Experiment Station, who had bred them from mushrooms, decaying potatoes, and decaying blackberry roots. On his request they have been given some study. The species of *Sciara* are so similar to one another in many respects, that it is difficult to recognize the various species from some of the descriptions published. Those bred from the mushrooms and potatoes, however, do not agree with any descriptions accessible to me, of either European or American species of this genus, and they are herewith described as new:

SCIARA MULTISETA n. sp. Head and thorax fuscous; abdomen a variable dark ochreous; antennæ brownish with a thin whitish pubescence; palpi yellowish; wings somewhat iridescent, hyaline, anterior veins dark ochreous; halteres fuscous apically, pale yellowish at the base; coxa yellowish, femur darker, tibia still darker, and tarsi fuscous distally.

Antennæ longer than the head and thorax; basal segments enlarged; first, cuboidal; second, globose; third to fifteenth nearly cylindrical, length, about twice the thickness, pedicel distally; terminal segment conical. Palpi: basal segment short; second broadly ovate, apically with a large sensory pit; third, elliptical, shorter than the second; fourth, one-third longer than the preceding; each with scattering large setæ and numerous minute ones which have a verticillate arrangement on the last two segments.

Thorax with scattering hairs; on the scutum of the mesothorax there are three rows of fine setæ on its dorsal surface.

Wings, subcosta (1st longitudinal) short, not extending to the fork of the second branch of radius (3rd longitudinal) and media (4th and 5th longitudinals). First branch of radius (2nd longitudinal) extending a little beyond the middle of the wing and just beyond its middle, joined by the small cross-vein to the second branch, and joining costa before the fork of media. Second branches of radius and media, about equidistant from the apex of the wing. Second branch of media (5th longitudinal) and the two branches of cubitus (6th and 7th longitudinals) reaching border of wing at nearly equal distances from each other in the female—in the male, the branches of cubitus are a little nearer each other. The anal vein (8th longitudinal) over half, in the female, and two-thirds in the male the length of the preceding vein (Pl. VI, Figs. 1, 2).

*Communicated by E. P. Felt, D. Sc.

Fore coxa nearly three-fourths the length of the femur or tibia; tarsi longer, first segment nearly as long as the remaining four; middle legs about as the fore legs; posterior tibia longer than the slightly elongated femur; first segment of the tarsi, equal to the remaining segments.

Abdomen of both sexes sparsely invested with setæ. That of the female enlarges to the fourth segment from which it tapers to the slender ovipositor. Terminal portion of the genital plates oval.

Abdomen of the male nearly cylindrical and bearing the usual enlarged segment with claspers which are terminated by single stout curved spines. The whole of the terminal segment is more setose than are the preceding segments, especially the claspers on their tips and inner margins. On the median line of the ventral sclerite there is a thick group of stout setæ. (Pl. VI, Fig. 11.) Near the basal third of the clasper there is a very long seta, extending nearly to the median line. There is also a pair of long, stout setæ, a dorsal and a ventral one, at the base of each clasper.

Length: male, body, 2.5 mm., wing, 2.4 mm.; female, body, 3 mm., wing, 2.8 mm.

This species was reared by Dr. Smith from mushrooms.

The specimens reared by him from decaying potatoes resemble the preceding species in many ways; however, on further study it was found to be quite distinct. Its description follows:

SCIARA PAUCISETA n. sp. Head, thorax and abdomen black; antennæ light brown with a thin whitish pubescence; palpi light brown; wings hyaline, somewhat iridescent, anterior veins nearly black; halteres fuscous apically, yellowish at the base; coxa and femur yellowish, tibia darker, tarsi nearly black.

Antennæ longer than head and thorax; basal segments enlarged, first, cuboidal; second, globose; third, about one-fourth longer than fourth; fourth to fifteenth nearly cylindrical; proximal segments barely twice as long as thick; distal, nearly two and one-half times as long as thick; apical segment nearly conical. Palpi: basal segment short; second elliptical oval, apically with a large sensory pit; third subelliptical, one-third shorter than either preceding or terminal segment; fourth slender; each with a few large setæ and numerous minute ones, which have a verticillate arrangement on the third and fourth segments.

Thorax with scattering hairs on the scutum of the mesothorax; the three rows of minute setæ are easily seen on its surface in some specimens.

Wings: subcosta (1st longitudinal) short, not extending to the fork of the second branch of radius (3d longitudinal) and media (4th and 5th longitudinals). First branch of radius (2d longitudinal) joining costa before the fork of media near the middle of the length of the wing and joined beyond its middle to the second branch by the short cross-vein. Tip of second branch of media (5th longitudinal) nearer apex of wing than is the point where the second branch of radius joins costa. The two branches of cubitus (6th and 7th longitudinals) and the second branch of media reaching the margin of the wing nearly equidistant. Anal vein (8th longitudinal) two-thirds the length of the second branch of cubitus in the female, in the male it is but one-half. (Pl. VI, Figs. 3, 4.)

Fore coxa a little over one-half the length of femur or tibia, tarsi about one-fourth longer, first segment nearly equal to the remaining segments; middle legs nearly the same; posterior tibia one-fourth longer than the slightly elongated femur; first segment of tarsi equal in length to the remaining segments.

Abdomen of both sexes sparsely invested with setæ. The abdomen of the female enlarges slightly to the fourth segment, from which it tapers moderately to the slender ovipositor; the terminal portion of the genital plates oval.

Abdomen of the male nearly cylindrical and bearing the usual enlarged segment with claspers which are terminated by a single stout curved spine. The setæ are thickest on the claspers, especially on the apical portion and along the inner margin. On the median line of the ventral sclerite of the last segment there is a sparse group of stout setæ, each arising from an enlarged base (Pl. VI, fig. 12). Near the basal third of the clasper there is a very long seta on its inner margin, extending nearly to the median line. There is also a pair of long stout setæ, a dorsal and a ventral one, at the base of each clasper.

Length: male, body 2.75 mm., wing 2.5 mm.; female, body 3.5 mm., wing 3 mm.

This species may be separated from the preceding by the darker color of the palpi, thorax, and abdomen, by the greater length of the third antennal segment, and by the few setæ in the group on the median line of the ventral sclerite of the terminal segment in the male.

Numerous small flies of this genus were found in the mushroom cellar of Dr. Wm. Hailes, of Albany, N. Y., June 6, 1896. It was stated that at times the cellar would be almost black with this and other species, although they were by no means so abundant when the cellar was visited by me. With the advent of hot weather the flies become so numerous as to destroy the mushrooms quickly and render their further culture unprofitable.

The flies agree with no description of American forms known to me. The species is evidently closely related to *Sciara villosa* Winnertz, though apparently different.

SCIARA AGRARIA n. sp. Head and thorax a very dark brown, nearly black, shining; abdomen a variable dark brown, base of terminal segment and base of claspers in male with a yellowish cast; antennæ dark brown with a dense whitish pubescence; palpi dark brown, terminal segment a little lighter; wings iridescent, tinged with fuscous, anterior veins nearly black, the others pale yellowish: halteres fuscous apically, yellowish at the base; coxæ smutty yellow, anterior pair lighter, femora and tibiæ a little darker, and tarsi fuscous distally, tibial spurs yellow.

Antennæ half the body's length in the male, in the female about one-third; the enlarged basal segments globose; the third to the fifteenth as long as thick, cylindrical, terminal one subconical. Palpi; second segment subelliptical, with a medium sized sensory pit; third suboval,

shorter; fourth slender, almost linear and equal in length to the second; each with a few scattering long setæ and numerous small ones having a more or less verticillate arrangement.

Thorax with a few longer setæ and a number of shorter ones which show traces of being arranged in three longitudinal rows on the scutum of the mesothorax.

Wings: subcosta (1st longitudinal) short; first branch of radius (2nd longitudinal) joined to the second branch (3d longitudinal) at two-thirds its length by the short cross-vein and uniting with costa about the middle of the wing, some little distance before the fork of media (4th and 5th longitudinal). Second branch of media (5th longitudinal) nearer the apex of the wing than the tip of the second branch of radius. The distance between the two branches of cubitus (6th and 7th longitudinal) along the margin of the wing is greater than between the second branch of media and the first branch of cubitus. The anal vein (8th longitudinal) about half the length of the second branch of cubitus (Pl. VI, figs. 5, 6).

Fore coxa a little over half the length of either femur or tibia; tarsi one-fourth longer than tibia, first tarsal segment shorter than the remaining four; segments of the middle pair of legs a little longer than in the first, those of the posterior pair still longer, the first tarsal segment nearly equal to the remaining ones.

Abdomen of both sexes sparsely clothed with fine setæ. The female abdomen enlarges gradually to the fourth segment and then tapers to the slender ovipositor. Terminal portion of the genital plate elliptical.

Abdomen of the male nearly cylindrical. Terminal segment somewhat enlarged; claspers curved, each armed with an apical curved spine and with numerous stout ones along the inner margin. Near the basal third of the clasper there is a very long seta on its inner margin, extending nearly to the median line. There are also a pair of long stout setæ, a dorsal and a ventral one, at the base of each clasper (Pl. VI, fig. 10).

Length: Male, body, 2.5 mm., wing, 2.25 mm.; female, body, 3 mm., wing, 2.5 mm.

The following species was quite common in the greenhouse of Mr. J. A. Otterson, Berlin, Mass., and in others in the vicinity. During the winter the flies were more or less abundant, and their larvæ could be found in the soil. Under the influence of the higher temperature of the early spring the flies became very abundant. As giving an idea of their prolificacy, it may be interesting to note that over 625 eggs were found in the distended abdomen of a female. In this dissection no count was made of a number (estimated at approximately 200) of what appeared to be partly developed eggs. This species, described below, is closely related to *Sciara obscura* Winnertz.

SCIARA PROLIFICA n. sp. Female. Head and thorax dull black; abdomen brownish black, posterior margins of 4th to 6th segments, occasionally others, bordered with yellowish white; ventrally the abdomen is lighter and frequently its yellowish contents show through the distended lateral membranes. Antennæ and palpi nearly black, the former with a short whitish pubescence. Wings somewhat iridescent,

thickly specked with fuscous; anterior veins black, the others a smutty yellow. Knobs of halteres fuscous, pedicel yellowish. Coxæ and legs dark brown to black, the anterior coxæ sometimes lighter; tibial spurs yellow.

Antennæ equal in length to head and thorax; the two enlarged basal segments globose; 3d to 15th segments nearly cylindrical, about twice as long as thick; terminal segment subconical. Palpi; basal segment short; second irregular, rounded dorsally; third a little shorter than second, subrectangular in outline; terminal segment as long as second, slender; both large and small setæ exceptionally stout and numerous; smaller, verticillately arranged.

Thorax with scattering setæ. Wings: subcosta (1st longitudinal) short; first branch of radius (2d longitudinal) joined to the second branch (3d longitudinal) about midway of its length by the short cross-vein and uniting with costa at the outer third of the wing just beyond the fork of media (4th and 5th longitudinals); second branch of media (5th longitudinal) nearer the apex of the wing than the tip of the second branch of radius; the distance between the two branches of cubitus (6th and 7th longitudinals) along the margin of the wing is greater than that between the second branch of media and the first branch of cubitus (Pl. VI, figs. 8, 9). Fore coxa a little over half the length of either femur or tibia; tarsi one-fourth longer than tibia; first tarsal segment shorter than the remaining four; femur and tibia of middle pair longer, of the posterior still longer, than those of the anterior legs; first segment of middle tarsi not quite so long as the remaining segments, while that of the posterior is longer.

Abdomen sparsely clothed with fine setæ. The distended abdomen of the female enlarges to the third or fourth segment, and then tapers gradually to the slender ovipositor,—terminal portion of the genital plates oval.

The male differs in having a nearly cylindrical abdomen which is vested with stouter setæ. The basal portion of the enlarged terminal segment is unusually stout and the claspers are comparatively weak and irregular. Tips of the claspers terminated by a stout recurved spine and by numerous straight bristles on its inner margin.

Length: male, body 4.4 mm., wing 3.7 mm.; female, body 5.6 mm., wing 5 mm.

Males of the following species were reared by Dr. Smith from decaying blackberry roots. They resemble *Sciara ochrolabis* Loew closely, but differ from the types in the antennæ being barely as long as the head and thorax, while in *ochrolabis* they are longer. The basal joints of the antennæ in Loew's species appear to be much shorter than in the insect under discussion. It will also be found that the terminal abdominal segments are more hairy and the claspers more triangular than in *ochrolabis*.

SCIARI FULVICAUDA n. sp. Face ochreous; vertex dark ochreous; scape of antennæ yellow, flagellum dark ochreous with a rather dense whitish pubescence; palpi fuscous; dorsum of thorax yellowish to rufous, the scutellum of the metathorax with variable dark stripes, in some

specimens hardly discernible; pleura yellow; wings hyaline, iridescent, anterior veins fuscous, the lighter veins brown; knob of halteres fuscous with yellowish tip, pedicel yellowish; tip of trochanter black; coxa and femur dull yellow; tibia darker; tarsi fuscous apically; abdomen fuscous except the yellow terminal segment bearing the large ochreous claspers which are tipped with fuscous.

Antennæ barely as long as head and thorax; first segment cuboidal, second globose, third about one-fourth longer than the following; fourth to terminal one are nearly cylindrical, the proximal ones slightly gibbous and not twice as long as thick, length of distal ones about twice their thickness. Palpi; the small basal segment was not seen; the second is flattened, narrow at its base and is broadly oval distally, nearly equal to subsequent segments in length; third suboval, nearly equal to last; terminal segment rectangular in outline, about one-fourth longer than wide; each with a few scattering large setæ and numerous minute ones, which on the last segments have somewhat of a verticillate arrangement.

Dorsum of thorax invested with a number of large scattering hairs. Wings; subcosta (1st longitudinal) indistinct, short; first branch of radius (2nd longitudinal) joined before its middle by the short cross-vein to the second branch (3rd longitudinal), and uniting with costa beyond the middle of the wing and about on a level with the fork of media (4th & 5th longitudinals); tip of second branch of radius and media about equidistant from the apex of the wing; the second branch of media (5th longitudinal) and the two branches of cubitus (6th & 7th longitudinals) about equidistant on the border of the wing. Anal vein (8th longitudinal) about one-third the length of the second branch of cubitus (Pl. VI, fig. 7). Fore coxa about three-fourths the length of either femur or tibia; tarsi longer, first segment not so long as the remaining ones; middle legs about the same; posterior tibia about one-fifth longer than the slightly elongated femur, first segment of tarsi equal to the remaining ones.

Abdomen with numerous stout setæ. The enlarged terminal segment more thickly clothed with setæ and bearing large, subtriangular claspers (Pl. VI, fig. 13).

Length of body 4 mm., of wing 2.75 mm. Female unknown.

Phora albidihalteris n. sp.*

A Mushroom Phora.

(Ord. DIPTERA: Fam. PHORIDÆ.)

This insect was reared in numbers by Dr. J. B. Smith, from mushrooms. It is believed to be another form new to science and is herewith described.

PHORA ALBIDIHALTERIS.—Head and thorax jet black; palpi orange yellow; abdomen black in some specimens, in others the lateral margins and dorsum of terminal segments are dull yellow; wings hyaline, iridescent, heavy veins ochreous; capitulum of halteres yellowish white; legs a variable ochreous with the terminal segments darker.

*By E. P. Felt, D. Sc.

Ocellar triangle defined by a deep suture which extends down the front; three transverse rows of bristles occur on the front; six in the posterior row, consisting of a median pair and four lateral; the middle row is composed of four nearly equidistant bristles; six nearly so in the anterior row, the median pair and the smaller ones just in front point downward. Eyes bordered behind and below with a single row of bristles,—very minute setæ occur at the angles of the facets. Antennæ five-segmented; first short, irregular; second very large, subspherical; third and fourth cylindrical, slightly expanded apically; basal portion of the fifth cylindrical and more slender than the preceding, distal portion setaceous, much elongated, plumose. Labium yellow, usually retracted; palpi yellowish brown, somewhat fusiform and bearing several apical bristles; basal portion short, obscurely divided into several subsegments.

Dorsum of thorax thickly pubescent, several stout bristles occur near the posterior border of the scutum of the mesothorax and near the base of the wings. Costal vein less than half the length of the wing; first heavy vein joining costa near apical third of same; second heavy vein forked near the apex; costal margin fringed with stout setæ to tip of second heavy vein; the four wing pores on this vein are even more distinct than in *Phora agarici* Lintn.; first light vein nearly straight; second curved at basal fifth and apical fourth; third, fourth, and fifth, sinuate. Basal portion of halteres brownish-black, apical portion inflated, yellowish-white. Several apical bristles occur on the front and outer portions of the coxæ; fore tibiæ unarmed; middle and posterior tibiæ fringed with stout spines posteriorly, each with a large apical spine; tarsi about one-fourth longer than the tibiæ. Abdomen rounded dorsally, tapering from a broad base.

Length of body 1.92 mm.; of wing 2.4 mm.

Described from a number of specimens, all females. The puparium of this species resembles closely that of *Phora agarici* except that it is a little larger,—being about 2.4 mm. long.

Piophila casei (Linn.).

The Cheese Skipper: The Ham Skipper.

(Ord. DIPTERA: Fam. PIOPHILIDÆ.)

MACQUART: Hist. Nat. Ins.—Dipt., ii, 1835, pp. 541–542 (common).

WESTWOOD: Introduct. Class. Ins., ii, 1840, pp. 573–574 (mention).

KIRBY-SPENCE: Introduct. Entomol., 1846, p. 168 (mention as *Tyrophaga casei*).

PRETREAT: in Harper's New Month. Mag., xxii, 1861, p. 609, fig. 2 (popular account).

HARRIS: Ins. Inj. Veg., 1862, p. 621 (brief mention).

LOEW: in Amer. Journ. Sci.-Art., 2d Ser., xxxvii, 1864, p. 320 (accompanying man; translation by Baron Osten Sacken).

OSTEN SACKEN: in Amer. Journ. Sci.-Art., 2d Ser., xxxvii, 1864, p. 318 (common to Europe and America); Cat. Dipt. N. Amer., 1878, p. 199.

- PACKARD: Guide Study Ins., 1869, pp. 413-414, fig. 335; Entomol. for Beginn., 1888, p. 128, fig. 149 (brief mention).
- RILEY: 2nd Rept. Ins. Mo., 1870, p. 10 (an imported pest); in Amer. Entomol., ii, 1870, pp. 78-79 (habits of skippers; their natural food), pp. 180, 339 (mention); in id., iii, 1880, pp. 23-24 (injuring smoked hams).
- WILLARD: in Amer. Entomol., ii, 1870, p. 78 (treatment of skipper cheese).
- GLOVER: MS. Notes from My Journ., 1874, p. 40 (said to have been bred from salt alone by Germar).
- : Country Gent., xlv, 1879, p. 727 (general account).
- JACOBS: in Comp.-Rend. des Séances, Soc. Ent. Belg., 1882, pp. cxxiv-cxxv (synonymy, notes).
- MANN: in Psyche, iv, 1884, p. 207 (reference).
- FYLES; in 17th Ann. Rept. Entomolog. Soc. Ont., 1887, p. 38 (brief notice).
- RITZEMA BOS: Tiersche Schäd. Nützlinge, 1891, pp. 620-621 (brief mention).
- KELLOGG: in Insect Life, v, 1892, p. 116 (injuring smoked meats, duration of stages),
- MURTFELDT: in Insect Life, v, 1892, pp. 135-136 (bred from ham); in id., vi, 1893, pp. 170-175 (detailed account); the same in 24th Ann. Rept. Entomolog. Soc. Ont., 1895, pp. 98-102.
- RILEY-HOWARD: Insect Life, vi, 1894, p. 209 (damage by, duration of stages), p. 226 (mention).
- COMSTOCKS: Manual Study Insects, 1895, pp. 486-487 (brief mention).
- HOWARD: in Bull. 4 New Series, Div. Entomol., U. S. Dept. Agric., 1896, pp. 102-104, fig. 48 (general account).
- LINTNER: in Country Gentleman, lxi, 1896, p. 293 (general account).
- SMITH: Econom. Entomol., 1896, pp. 367-369, fig. 423 (habits, remedies).

A gentleman writing from Moorefield, W. Va., states, that about the 15th of January, some meat in his cellar which had lain in salt two months, was found infested with "skippers." He was of the opinion that "the insect was in the meat when butchered, and if the meat had been properly cured by salt, the germ would have been destroyed."

Request was made for some of the infested meat containing the "skippers," but answer was returned that there was none of it left,—what disposition had been made of it was not stated. It was learned that the meat was pork, and was on the point of being removed for converting into bacon, when the infestation was discovered.

There can be but little doubt that the insect was the "cheese-skipper," which is also known as the "ham-skipper" from its frequent occurrence in smoked hams. There would be no hesitation in referring it, without question, to this insect, were it not, first, for the unusual time of its appearance—early in January,—the earliest record heretofore given of it. It was thought that its early appearance may have been the result of a furnace-heated or otherwise unusually warm cellar drawing the flies

prematurely from their winter hiding-places; but it was learned from the gentleman that the cellar was not particularly warm, but that it was a dry one. Second; it has not hitherto been reported, so far as we know, upon meat simply salted and not yet smoked, nor has the experiment to rear it thereon been successful. Miss Murtfeldt has written: "I have not been able to make it oviposit on fresh meat of any kind, nor does it seem able to breed upon that which is simply salted, but not smoked, not even when such meat is folded in wrapping papers."

Description of the Insect.

The perfect insect is a small black fly about 5 mm. long, with a rather large head bearing reddish, prominent eyes, shown in both sexes at *d* and *e* in fig. 1. The veins of the wings are nearly colorless and much weaker than those of the common house-fly; it is also about half the size of the latter. The lower side of the head, the basal portions of the legs, portions of the tibiæ and tarsi of the posterior two pairs are a variable

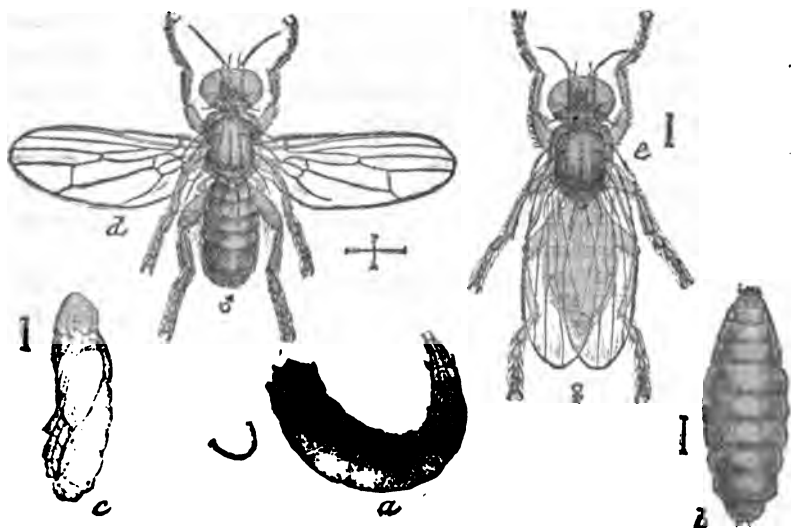


FIG. 1.—*PIOPHILAE CASEI*: *a*, larva; *b*, puparium; *c*, pupa; *d*, male fly; *e*, female with wings folded—all enlarged. (After Howard, Bull. 4 New Ser., Divis. Entomol. U. S. Dept. Agricul.)

yellow. The females are a little stouter than the males. The puparium from which the fly emerges has been described as of a golden yellow color—length about 4 mm.—its appearance is represented at *b*.

Though the parent flies may be seen in the vicinity of cheese and around smoked meats, they usually do not attract so much attention

as do their larvæ, commonly known as "skippers," from their habit of bringing the two ends of the body together and by sudden straightening with a quick muscular action throwing themselves to a distance of four or five inches or more. The larva or skipper "is cylindrical, tapering gradually toward the anterior end, truncate posteriorly, and furnished at this extremity with two horny projecting stigmata and a pair of fleshy filaments (see *a* in the figure). The egg is pearly white, slender oblong, slightly curved, 1 mm. in length, with a diameter of about one-fourth the length" (Murtfeldt).

Life-History.

For our knowledge of the life-history of the insect, we are mainly indebted to the careful observations of Miss Murtfeldt.

The eggs are deposited in more or less compact clusters of five to fifteen in the cracks and checks of cheese, upon the surface of cured or partially cured meats, and, in the case of canvassed meats, on the covering or in its folds; sometimes they are scattered singly. The number of eggs deposited averaged about thirty in the breeding cages, though the conditions were not normal and the number may have been diminished in consequence. A popular article in *Harper's New Monthly Magazine* (*loc. cit.*) credits this insect with depositing nearly three hundred eggs, which is probably a gross over-estimate.

The eggs hatch within thirty-six hours, and the tiny white maggots attack at once their food — in meat, the fatty portions. They complete their growth in seven to eight days and are then seven to nine millimeters (about one-third of an inch) in length. The transformation from the full-grown larva to the perfect fly occupies ten days. In the breeding cage, adult flies on an average did not live longer than a week. They would sip a little at sweets but were not greatly attracted to them, while the odor of smoked meats speedily drew them. The flies were not active at night, although they could perform their functions in partially darkened places. No definite succession of generations could be noted, but the insect in all stages was present from May until into October or November. Severe and protracted cold proved fatal to the insect in all its stages. The above is the result of Miss Murtfeldt's observations on the insect in the month of August and later.

In February of the same year, Prof. Kellogg, then of the Kansas State University, studied the development of this insect. According to his observations, the egg stage lasted four days; the larvæ required two weeks to complete their growth, and they remained in the pupa state one week. Dr. H. F. Kessler, as quoted by Dr. Howard, has carefully studied the life-history of this fly in Europe. He found that the average time

from the egg to the adult is four to five weeks, and that there are two or three generations during the summer,—the last occurring in September, the larva hibernating in the puparium and transforming to the pupa in May. Other writers claim that the insect passes the winter in the adult stage.

Food Habits.

The insect has long been known as a cheese pest. In a notice of it in 1879, by Prof. Riley, it is suggested that the original food of the skippers before cheese was ever made, must have been some analogous substance—possibly a peculiar kind of fungus. The following year he established the identity of the meat skipper with the well known pest in cheese.

In addition to smoked ham and bacon, the fly will also oviposit and breed in smoked beef, but apparently has a decided preference for pork. Such was the experience of a correspondent of Miss Murtfeldt, who wrote concerning injury to beef by skippers as follows: "If a beef ham were hanging beside that of a hog, the former would most likely be O. K. while the latter would be stung." Dr. Howard mentions chipped beef as one of the meats in which the fly will breed. To the above it seems that salt pork may also be added. "Germar is said to have bred this insect from salt alone" (Glover, *loc. cit.*), but if so, the larva must have developed in some other food and entered the salt for pupation.

The fly is said to be an excellent judge of cheese, and it is usually the best qualities that are affected. So marked is this, that "skippery" cheese may be pronounced of good quality, although hardly so because of the presence of the skippers.

Losses Caused by the Insect.

The principal damage in this country is believed to be confined to meats, although Mr. X. A. Willard (*loc. cit.*) in 1879 writes: "Immense losses are sustained every year on account of skippery cheese. Sometimes thousands of pounds in factories are tainted in this way, and the cheese has to be sold for what it will bring, while a portion is not infrequently so badly affected that it has to be thrown away at the factory."

In 1880, Prof. Riley (*loc. cit.*) recorded an injury of smoked hams to the extent of over two thousand dollars, inflicted by this insect upon a single firm in Peoria, Ill. Miss Murtfeldt, in 1892, was informed by an employé in one of the largest packing and curing establishments in the West, as follows: "It entails an enormous loss upon all our packing-house companies." Similarly, Prof. Kellogg's attention was called to the insect through the packing-houses of Kansas City, Mo., being seriously troubled by the pest.

Preventives and Remedies.

It is easier and much more desirable to prevent the infestation of cheese or cured meats than to remedy it after the trouble has begun. The primary cause of "skippery" cheese is said to be the want of proper care, and the same is equally true of "skippery" meat.

The flies can be excluded from rooms by the use of fine screens — a 24-to-the-inch wire mesh is said to be sufficiently fine. In households, cheese and cured meats can usually be stored in fly-proof receptacles, or else kept in absolute darkness, in which it is said the flies can not complete their life-cycle. Darkness would therefore be of service in large store-rooms for these articles.

Scrupulous cleanliness in and about all places where these products are handled or stored, will do much to lessen the attraction for the flies. In cheese factories, it has been recommended to wash the ranges and tables upon which the cheese is placed with hot whey, thus removing grease and giving a clean surface, not attractive to the insect. In hot weather, the bandages and sides of the cheese should be rubbed over at the daily turning, for the purpose of destroying or brushing off eggs which may have been deposited on the surface. The cheese may also be washed with hot whey or with lye, — the latter is a repellant as the fly avoids alkalies.

Smoked meats should be carefully guarded from infestation during the process of curing, and in hams and other meats that are encased, the covering should be so thick and so closely applied, as to effectually exclude the fly or its larvæ.

Infested rooms and factories should be thoroughly cleaned, fumigated with burning sulphur, and, where possible, washed with kerosene emulsion.

Skippery cheese and meat is not necessarily a total loss, although their presence seriously impairs the market value of the product and may render it unsalable. In many cases large portions will be found free from the skippers and in good condition, as their work does not induce putrescence with its attendant odor; if the affected parts are removed, the remainder may safely be used for food. In cheese the surface colonies of skippers can readily be cut out, and the young more deeply located, can be drawn to the surface, by pasting thick oiled paper over the place so as to exclude the air, and, by removing it from time to time for the destruction of the skippers collected beneath, and replacing it, the cheese may be freed from the infestation.

***Lebia grandis* (Hentz).**

(Ord. COLEOPTERA: Fam. CARABIDÆ.)

- HENTZ: in Trans. Amer. Philosoph. Soc., N. S., III, 1830, p. 253 (description).
- WALSH: in Pract. Entomol., ii, 1867, p. 121 (habits and description).
- GLOVER: in Rept. Comm. Agricul. for 1867, 1868, p. 63 (in Ill.); in id. for 1868, 1869, p. 80, fig. 6 (features and feeding habits).
- RILEY: in Amer. Entomol.-Bot., ii, 1870, p. 290-291, fig. 181 (destroys Potato beetle in Missouri); the same in 3rd. Rept. Ins. Mo., 1871, p. 100, fig. 41; in Insect Life, iv, 1891, p. 204 (in So. Dakota); Bull. 31 Divis. Entomol., U. S. Dept. Agricul., 1893, p. 87 (taken on golden rod).
- LEBARON: 1st. Rept. Ins. Ill., 1871, p. 64 (mentioned); 4th do., 1874, p. 45, fig. 11 (mention).
- REED: in Rept. Entomolog. Soc. Ont. for 1871, 1872, p. 71 (mention).
- THOMAS: 6th Rept. Ins. Ill., 1877, p. 90 (description), p. 162 (mention).
- SAUNDERS: in Rept. Entomolog. Soc. Ont. for 1878, 1879, p. 6 (operations in Canada); in do. for 1881, 1882, p. 10 (reference to captures).
- COMSTOCK: in Rept. Comm. Agricul. for 1879, 1880, p. 245, Pl. V, fig. 3 (active in New York); Manual Study Ins., 1895, p. 520, fig. 625 (mention).
- DIMMOCK: in Stand. Nat. Hist., ii, 1884, p. 396, fig. 481 (mention).
- LINTNER: in Orange County Farmer for Oct. 19, 1893, xiii, p. 1, c. 7 (identification and habits); 10th Rept. Ins. N. Y., 1895, p. 496 (abstract of preceding).
- SMITH: in Rept. N. J. Agricul. Expt. Stat. for 1893, 1894, pp. 566, 567, fig. 146 (mention); in id. for 1895, 1896, p. 455, fig. 60 (description, work in New Jersey); Econom. Entomol., 1896, p. 168 (mention).

During the month of October, examples of a beetle were received by me for identification, from Port Jervis, Orange Co., N. Y., of which marvelous stories had been in circulation in the vicinity among the farmers, and had found their way in a sensational article in the newspapers. It had been stated that it had made its appearance for the first time during the past summer, and that it was accomplishing wonders in destroying the potato beetle. It was to be seen running rapidly over the plants, seizing a beetle, giving it a bite and instantly killing it, and then treating one after another in the same summary manner.

As no insect of such remarkable ferocity and power was known to us as having been sent to our aid in efforts to control the Colorado potato

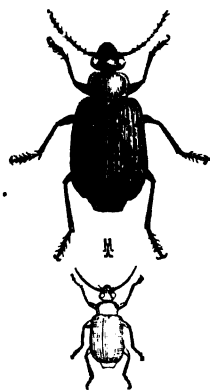


FIG. 2.—*LEBIA GRANDIS*.
In natural size and enlarged.

beetle, it was suspected that our new ally might be *Lebia grandis* which had been for many years rendering excellent service against the potato beetle in western States,—and such the insect, when received as above, proved to be.

The beetle has been described as follows:

Size rather below medium; elytra truncate or cut off at the extremity, leaving the tip of the abdomen exposed; anterior tibiæ, with the notch on the inner edge; claws distinctly pectinate; abdomen somewhat pedunculated; thorax rounded on the sides and wider than long; the posterior margin straight, with the angles somewhat obtuse, but not rounded, narrower than the elytra; elytra slightly widened posteriorly, of a deep or dark blue color, distinctly striate and without visible punctures. The thorax horny, yellow, smooth, with an impressed longitudinal dorsal line. Head yellowish, but a little darker than the thorax, the legs and breast also yellow. Length about or slightly over two-fifths of an inch; width of the elytra a little less than half the length.

It belongs to the large family of *Carabidæ*, which are commonly known as ground beetles and which render valuable service to the agriculturist in their preying upon many insect pests.

As may be seen from the references given above, this insect has long been recognized as one of the most efficient, if not the most efficient, of the thirty or more species of insects that have been observed to prey upon the Colorado potato beetle.

The first record, so far as we know, of the fondness of this insect for the Colorado potato beetle, is the brief mention by Mr. Glover, in his annual report to the Department of Agriculture, for the year 1867, to this effect: "Dr. Benjamin Morris, of Pittsfield, Illinois, found a species of ground beetle, *Lebia grandis*, feeding voraciously upon the larvæ in a potato field in that neighborhood. Hundreds of this comparatively rare insect were taken by him in the same locality, and always preying upon the grubs of the potato beetle."

In 1869, another notice of its operations in Illinois appears, in a statement made by Mr. Walsh, the entomologist of the State at that time, that it had been found destroying the larvæ of the potato beetle, while "so intent on its prey as to retain its hold even when the leaf was gathered on which it stood." In the notice of its identification by Mr. Walsh, he wrote of it: "This beetle is one of the vast group of ground beetles (*Carabus* family) almost all of which are cannibals; but the genus to which it belongs, unlike most of the other Ground beetles, haunts plants and is active by day, instead of living on the ground and being nocturnal in its habits."

In 1871, when the potato beetle had for the first time invaded the Dominion of Canada, and had not yet entered New York, Prof. Riley reported that this beetle was proving to be an efficient enemy of the new pest in several of the western States; and that although it had previously been rare in the State of Missouri it had suddenly become abundant and was actively engaged in destroying both the eggs and the larvæ of the potato beetle.

This beetle has a distribution throughout the United States which is almost co-extensive with that of the insect upon which it specially preys. Unfortunately, although so abundant oftentimes, and aided by nearly two score of other species, it is not able to greatly reduce the number of the greedy and insatiable *Doryphora*.

Plagionotus speciosus (Say).

The Sugar Maple Borer.

(Ord. COLEOPTERA : Fam. CERAMBYCIDÆ.)

SAY: Long's 2nd Expedit., 1824, p. 292 (original description, as *Clytus*); the same reprinted in Amer. Entomology, iii, 1828, p. 118, Pl. 53, fig. 1; Compl. Writ., Lec. edit., 1883, I, pp. 118, 193.

FITCH: in Amer. Quart. Journ. Agricul.-Sci., 1, 1845, p. 253, Pl. 3, fig. 3 (brief account, as *Clytus*).

HARRIS: Ins. Inj. Veg., 1862, pp. 101-102 (brief account, as *Clytus*).

PACKARD: Guide Study Ins., 1869, pp. 496-497 (mention, as *Clytus*); Bull. 7 U. S. Entomolog. Comm., 1881, pp. 103-105, fig. 45 (general account, as *Glycobius*); in Amer. Nat., xviii, 1884, pp. 1151-1152 (oviposition, as *Glycobius*); 5th Rept. U. S. Entomolog. Comm., 1890, pp. 374-379, figs. 137-140 (general account, as *Glycobius*).

WALSH-RILEY: in Amer. Entomol., i, 1869, p. 146 (description, as *Arhopalus*).

COWDRY: in Canad. Entomol., ii, 1870, p. 38 (as *Clytus*, rare at Stratford, Ont.).

CLEMENTI: in Canad. Entomol., iv, 1872, p. 37 (as *Clytus*, at Peterboro, Ont.).

REED: in Rept. Entomolog. Soc. Ont. for 1872, 1873, pp. 35-36, fig. 26 (description and life-history, as *Clytus*).

LEBARON: 4th Rept. Ins. Ill., 1874, p. 154 (reference, as *Clytus*).

BETHUNE: in Canad. Entomol., ix, 1877, p. 222, fig. 2 on Plate (brief account, as *Clytus*); the same in Ann. Rept. Entomolog. Soc. Ont., 1877, p. 23, fig. 2 on Plate.

THOMAS: 6th Rept. Ins. Ill., 1877, pp. 38, 44, 83, 151, iii, iv (in northern Illinois, as *Clytus*).

SAUNDERS: in Rept. Entomolog. Soc. Ont. for 1878, 1879, pp. 32-33 fig. 13 (brief account, as *Clytus*).

- ROGERS: in *Canad. Entomol.*, xii, 1880, pp. 149-151, fig. 21 (popular account, as *Clytus*); the same in *Rept. Entomolog. Soc. Ont.* for 1880, 1881, pp. 32-33, fig. 13.
- ZESCH-REINECKE: *List Coleopt. Buffalo and Vicinity*, 1880, p. 9 (listed, as *Glycobius*).
- BELL: in *Canad. Entomol.*, xiii, 1881, p. 236 (mention, as *Clytus*).
- LINTNER: 1st *Rept. Ins. N. Y.*, 1882, p. 297 (reference); in *Country Gentleman*, xlvii, 1882, p. 625 (very injurious to maples); 2d *Rept. Ins. N. Y.*, 1885, p. 227 (abstract); 3d do. for 1886, 1887, pp. 103-105 (notice of injuries, remedies); in *Country Gentleman*, liv, 1889, p. 579 (characteristics, remedies); 6th *Rept. Ins. N. Y.*, 1890, p. 169 (abstract); in *Country Gentleman*, lvii, 1892, p. 552 (attack identified); 8th *Rept. Ins. N. Y.*, 1893, pp. 202-205, fig. 45 (ravages and remedies); 9th do., 1893, p. 442 (abstract); in *Country Gentleman*, lviii, 1893, p. 557 (identified, remedies); in *Gardening*, iii, 1894, p. 56 (mention, figure); 10th *Rept. Ins. N. Y.*, 1895, p. 497 (reference, in all preceding referred to *Glycobius*), p. 504 (abstract), p. 511 (reference); in *Country Gentleman*, lx, 1895, p. 583 (remedies); 11th *Rept. Ins. N. Y.*, 1896, p. 280 (abstract), p. 286 (mention).
- DIMMOCK: in *Stand. Nat. Hist.*, ii, *Crust. Ins.*, 1884, pp. 330-331, fig. 368 (brief mention).
- FLETCHER: *Rept. Entomol.* for 1885, p. 31 (brief mention, as *Glycobius*).
- HARRINGTON: in 17th *Ann. Rept. Entomolog., Soc. Ont.*, 1887, pp. 29-30, fig. 3 (brief mention, as *Glycobius*).
- TOWNSEND: in *Psyche*, v, 1889, p. 233 (listed from Michigan).
- SMITH: *Cat. Ins. N. J.*, 1890, p. 203 (on oaks).
- PICKERING: in *Psyche*, vi, 1892, p. 346 (mentioned, as *Clytus*).
- COMSTOCKS: *Manual Study Ins.*, 1895, p. 570, fig. 694 (mention).
- FYLES: in 26th *Ann. Rept. Entomolog. Soc. Ont.* for 1895, 1896, p. 24, fig. 8 (mention, as *Glycobius*).
- WEED: *Bull.* 33 *N. H. Agricul. Expt. Stat.*, 1895, pp. 7-9, figs. 3, 4 (general account, as *Glycobius*).
- KIRKLAND: in *Bull.* 2 *Mass. Crop Rept.*, ser. of 1897, pp. 30-34, figs. 1, 2 (general account).

This large and beautifully marked beetle in its bright golden-yellow bands and bars and angulated lines on a background of black, is a desirable and attractive addition to one's collection (Pl. VII, fig. 1). Despite its beauty, it is a highly pernicious insect. Not content, as are most of its associates, with burrowing in dead or sickly trees, its attack is usually made on those perfectly healthy.

A Long-horned Borer.

This insect belongs to the family *Cerambycidae*, or long-horned wood-borers, — so named on account of their long antennæ and the habit their larvæ have, of living and boring in wood. The antennæ of some species are of extraordinary length, as in the instance of *Monohammus confusor*

(Kirby), in which they measure from about once and a half the length of the body in the female, to nearly four times its length in the male. Many of the members of this large family are remarkable for their size, beauty of color, or elegance of form, and have been, on these accounts, favorites with collectors. Unfortunately, a large number of the species, are quite harmful to the trees that they infest. Among the notorious and well-known pests, may be mentioned the oak-pruner, *Elaphidion parallelum* Newm.; the round-headed apple-tree borer, *Saperda candida* Fabr.; and the common elm-tree borer, *Saperda tridentata* Oliv.

Description of the Beetle.

"The head is yellow, with the antennæ and the eyes reddish-black; the thorax is black, with two transverse yellow spots on each side; the wing covers, for about two-thirds of their length, are black, the remaining third is yellow, and they are ornamented with bands and spots arranged in the following manner: a yellow spot on each shoulder, a broad yellow curved band or arch, of which, the yellow scutel forms the keystone on the base of the wing-covers; behind this a zigzag yellow band forming the letter W; across the middle another yellow band arching backwards, and on the yellow tip a curved band and spot of a black color; legs yellow, and the under side of the body is reddish-yellow, variegated with brown. Nearly an inch in length." (Harris.)

Ravages of the Insect.

This borer has for many years been destroying a large number of our sugar maples, as its burrows are usually carried around the trunk beneath the bark, and when several occur in the same tree, they girdle it by their interlacings and thus kill the tree. Even when they are not fatal to the tree, they occasion unsightly cracking of the bark and serious deformities of growth.*

As early as 1859, my attention was attracted by the operations of this insect in a long row of sugar maples bordering a lawn at Schoharie, N. Y. One tree which I had examined, of some ten inches in diameter at the base, which had been more seriously affected than the others, and probably was the first to be attacked, had been nearly destroyed. Several of the grubs had commenced their ravages side by side, and their united cuttings had in places exposed the trunk for over a hand's breadth. The tree had

*For additional features of these burrows see the Report of the Entomologist for the year 1886, [being the Third Report on the Injurious and Other Insects of the State of New York], page 104.

been attacked in various places from above its first limbs nearly to its base. The entire circumference of the tree had been grooved, although not continuously. In the above row of maples scarcely a single tree was entirely exempt from injury—all apparently the work of this grub.

A few years ago it was an occasion of much pain to me to see at Bennington, Vt., the large number of old maples that were standing dead upon the street or rapidly dying from the merciless burrowing of this borer which had scarred and excavated their trunks. Recently the same ravages, although not as yet to the same extent, were observed by me at Glens Falls, N. Y. This insect was recently very destructive to some fine maples at Canajoharie, N. Y. It is also a serious pest in some other states. In a recent publication, Mr. Kirkland (*loc. cit.*) records extensive injuries by this borer in the sugar orchards of western Massachusetts, their work being preceded in most instances by the clearing up of the underbrush. It was thought that the additional light around the trunks of the trees may have served the insect as an invitation to enter upon and prosecute its pernicious work. The maples on the grounds of Bowdoin College, Brunswick, Me., were observed by Dr. Packard to be seriously injured by this pest in 1873 and 1874. In London, Ontario, this insect is spreading rapidly and proving very destructive. In South Quebec the borer is so abundant as to be found frequently in woodsheds, having developed from maple wood stored for domestic use.

Formerly a Rare Insect.

This beetle was regarded by its original describer, Dr. Say, as a rare insect, for at the time of its description only two examples were known. It is one of our native forms which seems to have found the cultivated trees better adapted to its needs than the wild—their proximity, location and abundance having supplied ample means for a rapid increase. It is now a common insect and a serious menace to the safety of sugar maples, either in ornamental grounds or as shade trees along the road side.

Life-History.

The beetles make their appearance in this latitude during the latter part of June, through July and into August.* The eggs are laid during the latter two months. The place of oviposition may be recognized, as stated by Dr. Packard, "by a rusty irregular discoloration of the bark about the size of a cent, and especially by the 'frass' or castings which to the length of an inch or more are attached like a broken corkscrew to

* Examples in the State collection bear dates of capture from June 23d to August 9th.

the bark." The egg is deposited on the trunk at various heights from the ground upward to at least ten feet in low branching trees, and even higher when the infestation has been of long continuance. The newly hatched larva, about one-fifth of an inch in length, may be found within its burrow at a depth perhaps of one-tenth of an inch, by cutting in at the places indicated as above. September 12th, Dr. Packard found that the mines or burrows of the young larvæ were already about an inch long, most of them being directed upward. They pass the winter in shallow burrows in the bark. The following spring they burrow deeper and mine the cambium layer and the living wood,—the burrows steadily increasing in size with the growth of the larvæ. It is probable that the insect requires two years to complete its transformations, and that an entire season is spent by the long white fleshy grubs, with deeply marked transverse incisions, in running their mines or burrows, about one-third of an inch in depth and one-half an inch in width, in all directions beneath the bark. On the approach of the second winter the larvæ probably burrow to the depth of an inch or two in the trunk and there hibernate. In the spring feeding is resumed and the burrows continued a distance nearly equal to that of the previous season, before the pupal chamber is excavated in the wood. Mr. Kirkland found a number of burrows in an infested tree with a chamber midway of their length, and thought that this might indicate the place of hibernation. The larval burrows usually run upward and partially around the trees, but occasionally downward. They frequently intersect, and thus a badly infested tree may be effectually girdled and killed.

Distribution.

The recorded distribution of this beetle is curiously limited. The explanation may be that only within this area has it been sufficiently abundant to attract attention, although it would seem that even if rare, some examples should fall into the hands of collectors and the localities be made known. The reported distribution is as follows; South Quebec, the southeastern portion of Ontario, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Michigan, Indiana, Northern Illinois and Wisconsin. This record indicates comparatively narrow bounds, but it will probably be found that it extends over a much greater area than indicated above. There is apparently no reason why it should not extend to the Rocky Mountains, if not to the Pacific coast.

Food Plants.

This insect, so far as known, is mainly confined to the sugar maple, while exceptionally attacking other of the maples. In New Jersey there are very few maples where it was found, and in every instance the beetles were taken on oaks. It was therefore thought that possibly it may infest some of the species of oak (Smith: *loc. cit.*).

Natural Enemies.

The only natural enemies of this insect recorded are various species of woodpeckers. Dr. Packard mentions having observed them at work, but he failed to indicate the species. Mr. Kirkland observed the hairy woodpecker, the downy woodpecker, and the flicker feeding upon white larvæ taken from beneath the bark of infested trees.

Remedies.

Perhaps the best remedy is the cutting out or destroying the young grubs while still within easy reach. By carefully examining the trunks sometime in the early autumn, the location of the recently hatched grub may be easily detected by the indications stated on a preceding page.

The trunks of the trees may be painted or sprayed with a solution of soft soap and carbolic acid, renewing the application as often as it is washed off by the rains. If this be done during the months of July and August (the period of oviposition), the beetles will be deterred from depositing their eggs in the trunks so treated and there will be no necessity of searching for and digging out the young grubs later in the season.

In maple sugar groves, Mr. Kirkland recommends that as much underbrush be allowed to grow as will not be in the way of the sugar making, as he has observed that the clearing up of the shrubbery has repeatedly been followed by severe attacks of these borers. The beetles are sun-loving insects which delight in sunny places and if there are few such spots in a sugar grove, there would be less attraction for them. All badly infested trees should be cut for fuel during the autumn and burned before the time for the appearance of the beetle the following June.

Saperda tridentata* Olivier.The Elm Borer.*

(Ord. COLEOPTERA: Fam. CERAMBYCIDÆ.)

- FITCH: in Trans. N. Y. St. Agricul. Soc. for 1858, 1859, pp. 839-840 (brief account); 5th Rept. Nox. Other Ins. N. Y., 1859, pp. 59-60 (the same).
- HARRIS: Ins. Inj. Veg., 1862, pp. 111-113, Pl. II, fig. 13 (description and ravages).
- PACKARD: in Amer. Nat., iv, 1870, pp. 588-591, figs. 115, 116 (general account after Harris, as *Compsidea tridentata*); Bul. 7 U. S. Entomol. Comm., 1881, pp. 58-59, fig. 17 (brief account); 5th Rept. do., 1890, pp. 224-226, fig. 71 (general account), p. 424 (infesting maple).
- HUBBARD: in Psyche, i, 1874, p. 5 (mention); in id., ii, 1877, p. 40 (mention, as *S. trinlicata*).
- LECONTE: in Smith. Misc. Coll., xi, 1874, pp. 238-239 (table of species of *Saperda*).
- THOMAS: 6th Rept. Ins. Ill., 1877, pp. 38, 44, 156-157, ii (brief notice).
- ZESCH-REINECKE: List. Coleopt. Buffalo and Vicin., 1880, p. x.
- HARRINGTON: in Canad. Entomol., xv, 1883, p. 79 (infesting maple); the same in 14th Rept. Entomol. Soc. Ont., 1884, p. 35; in Canad. Entomol., xxii, 1890, p. 186 (listed from the counties of Argenteuil and Ottawa).
- FORBES: 14th Rept. Ins. Ill., 1885, pp. 112-114, Pl. xii, fig. 2 (general account of ravages, remedy).
- SMITH: Cat. Ins. N. J., 1890, p. 212 (common at Newark, Caldwell).
- CAULFIELD: in 21st Ann. Rept. Entomol. Soc. Ont., 1891, pp. 73-74 (brief account).
- GARMAN: Bull. 47 Ky. Agricul. Expt. Stat., 1893, pp. 44-50, figs. 12, 13 (general account); the same in 6th Rept. do., 1894, pp. 122-127, figs. 12, 13.
- LINTNER: in Proc. West. N. Y. Horticul. Soc., 1893, separate, pp. 7-9 (ravages, remedies); republished in Gard. Forest, vi, 1893, p. 76, and in 9th Rept. Ins. N. Y., 1893, pp. 427-429; in Albany Evening Journ., for May 7, 1894 (work in Albany, remedies); 10th Rept. Ins. N. Y., 1895, pp. 484, 485, 499 (abstracts of preceding notices); in Country Gentleman, lxi, 1896, p. 746 (remedies).

This insect appears to be as injurious to the beautiful white elm, *Ulmus Americana*, which has been so liberally planted and is so highly prized as our most valuable shade-tree, as the maple borer, *Plagionotus speciosus*, is to the very desirable sugar maple. The borers in the wood and bark of our trees are dreaded most deservedly, not only on account of their oftentimes excessive injuries, but for the reason that their operations are of such a nature that severe damage, if not fatal injury, is often done before their presence is even suspected. The unthrifty condition of the infested

tree is attributed to unusual dry weather, to the impervious street pavements of many of our cities, to defective gaspipes, or some other cause, while the true agents of the mischief continue their destructive work unknown and undisturbed. Throughout the entire State, and beyond its limits, the American elm has for a number of years been suffering from the ravages of this hidden and insidious enemy, the trees dying one by one from a cause, not apparent, and known to but a few.

Character and Extent of Injury.

The larvæ or grubs of this insect work in the inner bark and sap-wood of the trunk,—the attack apparently commencing not far above the ground and gradually extending upward. Most of the burrows are in the inner bark, although a few occur at the depth of an inch or more. When the grubs are numerous, their broad flat burrows, varying from one-tenth to two-tenths of an inch in width and about one-tenth of an inch deep, so reticulate and run into one another as effectually to girdle trunks of trees two or three feet in diameter, when, with the circulation arrested, the death of the tree inevitably follows. The bark is frequently so badly infested that in old trees it can be detached in large sheets. The work of this pest is shown in figures 4, 5, of plate VII.

As early as 1847 and 1848, Dr. Harris had noticed that this insect was very injurious to the elms on Boston Common. He wrote as follows :

The trees were found to have suffered terribly from the ravages of these insects. Several of them had already been cut down, as past recovery ; others were in a dying state, and nearly all of them were more or less affected with disease or premature decay. Their bark was perforated, to the height of thirty feet from the ground, with numerous holes through which insects had escaped ; and large pieces had become so loose by the undermining of the grubs as to yield to slight efforts, and come off in flakes. The inner bark was filled with the burrows of the grubs, great numbers of which, in various stages of growth, together with some in the pupa state, were found therein ; and even the surface of the wood, in many cases, was furrowed with their irregular tracks.

Most of the wood and bark borers are partial to diseased and dying trees, as is well known to many. An enfeebled condition of the trees from their age or some other cause, may account for the severity of the attack noted above. Dr. Fitch, in his Fifth Report, records that the larvæ of this insect infested the remaining bark of all of the slippery elms, *Ulmus fulva*, in his vicinity, after the best of it had been stripped off for medicinal purposes. The operations of this insect appear to be notorious, for it has been characterized by Dr. Packard as the most destructive borer in the Northern and Eastern States, often killing trees by the wholesale. In 1884, its ravages were so serious that Prof. Forbes wrote :

"From the present appearance of the elms throughout the towns of Central Illinois, where I have had an opportunity to examine their condition, and from the rapid progress which this pest has made among them during the last two or three years, it seems extremely likely that it will totally exterminate the trees unless it be promptly arrested by general action." A serious attack is recorded upon the elms at Frankfort, Ky., in 1892, when several were killed and a number badly injured. The insect has also been very destructive to elms in Albany and in Gloversville, N. Y. It does not appear to be so injurious in Canada as in the United States. It has been found infesting a dead maple by Mr. Harrington.

Description of the Insect.

The beetle is an innocent appearing slate-colored insect with dull orange markings as follows: a curved line behind each eye, a line on each side of the thorax, and margined wing-covers with three nearly equidistant points extending from the border. They vary in length from about one-third to one-half an inch. The females are considerably stouter and with shorter antennæ than the males (Pl. VII, fig. 2).

The borers (the larvæ of the beetles), are similar in form and general appearance to the notorious round-headed borer of the apple, belonging, indeed, to the same genus. They rarely exceed three-fourths of an inch in length, are destitute of feet, and have the usual enlargement of the first segment of the body immediately behind the head. (Forbes.)

The larva is white, subcylindrical, a little flattened, with the lateral fold of the body rather prominent; end of the body flattened, obtuse, and nearly as wide at the end as at the first abdominal ring. The head is one-half as wide as the prothoracic ring, being rather large. The prothoracic segment, or that next to the head, is transversely oblong, being about twice as broad as long; there is a pale dorsal corneous transversely oblong shield, being about two-thirds as long as wide, and nearly as long as the four succeeding segments; this plate is smooth, except on the posterior half, which is rough, with the front edge irregular and not extending far down the sides. Fine hairs arise from the front edge and side of the plate, and similar hairs are scattered over the body and especially around the end. On the upper side of each segment is a transversely oblong ovate roughened area with the front edge slightly convex, and behind slightly arcuate. On the under side of each segment are similar rough horny plates, but arcuate in front, with the hinder edge straight. (Packard.)

The larva differs from the allied linden borer, *Saperda vestita* Say, in its shorter, broader, and more hairy body, and having the tip of the abdomen hairy and more depressed. The prothoracic segment is broader and flatter, and the rough portions of the dorsal plates are larger and not so transversely ovate. The mandibles are much longer and more slender, and the antennæ much smaller than in *S. vestita*.

Life-History.

The period required by this insect to complete its life cycle is at least one year and is probably several. The eggs are deposited upon the bark in June and the larvæ hatching therefrom are nearly full grown before winter, according to Dr. Fitch. On the other hand, Dr. Packard, writing in December, 1870, mentions finding "three different sizes of the larvæ, evidently one, two, and three years old, or more properly six, eighteen, and thirty months old." This latter statement has evidently been overlooked by more recent investigators, and no attempt seems to have been made to determine the true period of development. Possibly the beetle may complete its transformations in one year, yet the allied round-headed borer of the apple-tree, *Saperda candida*, requires three. The winter is passed in the larval or grub stage. Pupation occurs about the middle of April in central Illinois, and imagoes may emerge from early in May until the latter part of June in that latitude. In Massachusetts, Harris records taking living beetles repeatedly from early June to the 10th of July. Mr. Harrington has taken the beetle June 15th in Canada.

Associated Insects.

An ally of the *Saperda* is found in *Neoclytus erythrocephalus* (Fabr.). This insect appears to feed mostly on dead wood, apparently following the attacks of the more pernicious species. Occasionally it occurs in numbers in trees infested with *Saperda tridentata*. It may feed in such places only on the dying tissues left by its predecessor. As an evidence of its abundance, the following may be noted: From a section of the trunk of an elm, three inches long and six inches in diameter, infested by the *Saperda* and brought to my office about the first of April, eleven examples of the *Neoclytus* emerged between April 29th and May 12th, 1882. Large numbers of them were bred from other portions of the affected tree secured later—sixteen examples on the 23d of June, and others thereafter until July 1st. It has also been reared by me from hickory, from twigs of locust, and from pear twigs infested with *Xyleborus*, received from Mr. Pomroy of Lockport, N. Y. It is represented in figure 3 of plate VII. Another insect found associated with it in the dead wood of infested elms is the Curculionid, *Magdalis armicollis* (Say). This insect usually attacks the upper branches, but also occurs with the *Saperda* and *Neoclytus* in the trunk.

Distribution.

The ravages of this insect have been reported from the Provinces of Ontario and Quebec, and from the following states: Massachusetts, Rhode Island, New York, New Jersey, Kentucky, Illinois and Michigan. In all probability it occurs also in the intervening states of Pennsylvania, Ohio and Indiana.

Parasites.

Several parasites have been bred from this insect or the species associated with it in infested trees, but they are comparatively few in number and can therefore be of little importance in keeping this pest or its associates in check. The parasites apparently have not been identified or referred positively to the proper host.

Remedies.

Badly infested trees should be cut and the wood burned or the grubs within destroyed in the winter or early spring before they have had an opportunity to escape and perpetuate their kind.

If the attack has not proceeded too far, protection may probably be obtained by coating the bark with some thick repellent substance (of which carbolic acid and Paris green should be components) that would repel egg deposit or prevent the entrance of the newly hatched larvæ. This coating need not be applied to the entire trunk, but might be limited to a broad zone of several feet, at and beyond that part where the burrows of the preceding year were mainly run — to be found by removing portions of the bark, which will readily scale off from the older infested portions.

A still better remedy, probably, would be the following: Remove the outer bark from the entire infested portion of the tree in the spring (occupied at the time by the larvæ or the pupæ) by shaving it down to the inner bark until the first indications of the fresh burrows are disclosed. A kerosene emulsion of good strength brushed over the shaven surface would kill the insects, after which a coating of some thick substance, as lime and cow-dung, should be applied to prevent the splitting of the sapwood from exposure to the sun, drying winds or extreme weather.

That the barking of elms to even a greater extent than the above may safely be resorted to, appears from experiments made in France by M. Robert, detailed in the *Gardeners' Chronicle and Agricultural Gazette*, for April 29th, 1848, and quoted by Dr. Packard in his report on "Insects Injurious to Forest and Shade Trees" (1890), as follows:

"The whole of the outer bark was removed from the elm (this may be done conveniently by a scraping-knife shaped like a spoke-shave). This operation caused a great flow of sap in the inner lining of the bark (the liber) and the grubs of the Scolytus beetle were found in almost all cases to perish shortly after. The treatment was applied on a large scale, and the barked trees were found, after examination by the commissioners at two different periods, to be in more vigorous health than the neighboring ones of which the bark was untouched. More than two thousand elms were thus treated."

M. Robert had also obtained good results from cutting out strips of the bark of old elms of about two inches wide from the boughs down to the ground. "It was found that where the young bark pressed forward to heal the wound and a vigorous flow of sap took place, many of the larvæ near it were killed,—the bark that had not entirely been undermined was consolidated, and the health of the tree improved."

Oriocerus 12-punctata (Linn.).

The Twelve-spotted Asparagus Beetle.

(Ord. COLEOPTERA : Fam. CHRYSOMELIDÆ.)

- LINNÆUS: Syst. Nat., Edit. xii, i, pars ii, 1767, p. 601, no. 110 (description).
 LINTNER: 1st Rept. Ins. N. Y., 1882, p. 244 (recently introduced); 8th do., 1893, p. 250 (mention); 10th do., 1895, p. 517 (from Brighton, Monroe Co., N. Y.).
 RILEY: in Amer. Nat. for Feb. 1883, p. 199 (introduction); Bull. 31 Divis. Entomol., U. S. Dept. Agric., 1893, p. 67 (listed).
 HORN: in Canad. Entomol., xvi, 1884, pp. 183-184 (mention).
 RILEY-HOWARD: in Insect Life, iv, 1892, pp. 395-396 (occurrence in Maryland and District of Columbia).
 HOWARD: in Insect Life, v, 1892, p. 98 (spreading slowly).
 SMITH: in Insect Life, v, 1892, p. 94 (in New Jersey); in id., vi, 1893, p. 191 (spread); in Rept. N. J. Agric. Expt. Stat. for 1892, 1893, p. 393 (spreading in New Jersey); in id. for 1893, 1894, pp. 444-445 (continues to spread); in Bull. 6 New Ser., Divis. Entomol., U. S. Dept. Agric., 1896, p. 62 (spreading over entire State); Econom. Entomol., 1896, p. 212 (brief mention); in Entomolog. News, viii, 1897, p. 181 (in Monmouth Co., N. J.).
 WEBSTER: Bull. 51 Ohio Agric. Expt. Stat., 1894, p. 121 (mention).
 LAURENT: in Entomolog. News, v, 1894, p. 292 (mention).
 JOHNSON: in Bull. 6 New Ser., Divis. Entomol., U. S. Dept. Agric., 1896, p. 65 (becoming quite common); in 9th Rept. Md. Agric. Expt. Stat., 1896, p. 225 (common and spreading).

WICKHAM: in *Canad. Entomol.*, xxviii, 1896, p. 74 (mention).

CHITTENDEN: in *Year Book U. S. Dept. Agricul.* for 1896, 1897, pp. 349-352, fig. 89 (general account).

SKINNER: in *Entomolog. News*, viii, 1897, p. 230 (in localities in Pa.).

The common asparagus beetle, *Crioceris asparagi* (Linn.), has long been known to most growers of this plant on and near the Atlantic coast in New Jersey, Delaware and Maryland, while recently it has extended its range inwardly, and has appeared in various localities in eastern, central and western New York, and has entered Ohio. This destructive pest is, however, not the only asparagus beetle now established within the State of New York.

Twelve-spotted Asparagus Beetle in Monroe County.

This near relative of the common asparagus beetle was found infesting an asparagus bed in Brighton, Monroe county, N. Y., in comparatively small numbers in 1893 on the farm of Mr. Silas J. Robbins. Early in May of the following year a few of the 12-spotted variety were to be seen among the hundreds of the more common species. The latter part of the month; however, Mr. Robbins wrote: "Yesterday the asparagus beetles came out in full force. In many places quite as many red ones [*12-punctata*] as of the common kind." The appearance of the insect in such large numbers the second year of its observed presence would indicate that the climatic conditions of its newly adopted home were very favorable to its multiplication.

This insect has evidently prospered in this new locality as Mr. C. J. Chism, of Brighton, informed me in Sept., 1897, that it was very injurious, more so than *C. asparagi*. It had spread from the farm of Mr. Robbins to others in the vicinity and was regarded as a serious pest. The beetle was said to eat into the growing shoots more than does the common species, and thus render them unfit for market.

Description of the Insect.

The beetles of this species are easily distinguished from the more common form. They may be recognized by the twelve black spots on their orange-red elytra. The thorax is a deeper orange red. The eyes, antennæ, tips of the femora and tibiæ, the tarsi, and portions of the ventral surface are black. In form it is a stouter and larger insect than *asparagi*. At a little distance, they resemble somewhat closely, it is said, the ripening asparagus berry.

"The full-grown larva is shown in the illustration at fig. 3*b*. It measures, when extended, three-tenths of an inch (8 mm.), being of about

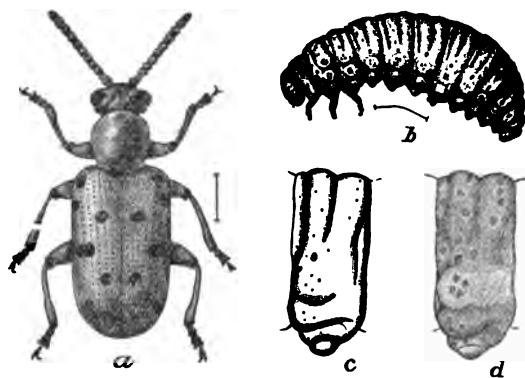


FIG. 3.—*CRIO CERIS 12-PUNCTATA*: *a*, beetle; *b*, larva. (After Chittenden, Year-book U. S. Dept. Agr., 1896.)

the same proportions as the larva of the common species, but is readily separable by its ochraceous orange color. The ground color is light yellowish cream with an overlay of ochraceous orange which is most pronounced on the exterior portions of the abdominal segments.

The head, with the exception of the mouth-parts, is also ochraceous, the thoracic plate is prominent, divided into two parts, and is of a dark-brown color. Enlarged figures of the second abdominal segment of both species are presented at fig. 3 *c* and *d*, for comparison." (Chittenden.)

Life-History and Habits.

Comparatively little is known of the life-history of this species. Two annual broods are ascribed to it in Europe, while there are presumably three in this country, especially in the southern portions. The eggs are not known, although it has been suggested that they may be deposited, like those of *C. asparagi*, on the leaves and stems. But few larvæ have been observed. One was found on the foliage and others in various stages, were feeding in the berries. The infested fruit reddens prematurely, is reduced to pulp, and the larvæ, on completing their growth, enter the ground for pupation. The food of the earlier brood appears unknown, unless it be the foliage, as with the common species. In the latter part of the season the berries are preferred by the larvæ. In Europe, the insect is said to pass the winter in the pupa state, but in this country some, judging by analogy, are of the opinion that it more probably hibernates in the adult form. Pupation occupies about two or three weeks during the summer and if the insects hibernate as beetles, the pupation of the later brood would probably occupy but little longer.

The few beetles observed by Mr. Robbins in early May were most likely the last of the overwintered beetles or, if hibernating as pupæ,

recently issued ones. Their abundance noted by him the latter part of the month is possibly due to the appearance of individuals of the second brood. The beetles feed, like the more common species, on the foliage. They will also feed on the berries, in confinement, at least. This insect is more ready to take to flight and is less apt to hide behind the stems when disturbed, than is its congener.

Introduction and Distribution.

This is another addition to the list of insect pests accidentally introduced into this country from Europe. It was discovered in 1881 in the vicinity of Baltimore, Md., by Dr. Otto Lugger. The insect was quite abundant when found, showing that the date of its introduction was probably several years earlier.

Assuming Baltimore or its vicinity as the place of introduction, the spread of the insect may be traced southward across several counties and into the District of Columbia, where it was detected in 1896. Later it invaded Virginia in the vicinity of Washington, and now it has been detected as far south as Westmoreland county of that State. In 1892 it was found in Gloucester county, N. J. When spreading from Maryland to New Jersey, it also established itself in northern Delaware. The next year its presence was announced in the adjoining counties of Cumberland and Camden, N. J. The progress of the insect over New Jersey has been so rapid that in 1897, Dr. Smith found the insect in Monmouth county, nearly as far north as Staten Island. It has also established itself in parts of Pennsylvania near the southern portion of New Jersey, having been found there in 1894. The same year it was received by me from Monroe county, N. Y.

The known distribution of this insect is about as follows: The northeastern portion of Virginia along the Potomac and Chesapeake bay, the District of Columbia, Maryland, the northern portion of Delaware, the southeastern part of Pennsylvania, New Jersey as far north as Monmouth county, at least, and a colony in the vicinity of Rochester, Monroe county, N. Y. It will probably spread over a considerable area in the central portion of the State, and it may be expected to enter both Staten and Long Island in the near future, from its northern extension in New Jersey.

Distribution of *Crioceris asparagi*.

The distribution and spread of the common species will give some idea of what may be expected of the twelve-spotted form. *Crioceris asparagi* was first detected in this country in Queens county, Long

Island. It is now generally distributed through the States of Maryland, Delaware, New Jersey and in Pennsylvania along the Delaware river. It is known in Connecticut and Rhode Island, and is widely, though locally, distributed in Massachusetts. In the latter State it has worked along the seacoast, establishing itself in places where its food-plant was found. It has also made its way to a considerable distance inland, presumably on the plants purchased for the setting out of new beds. In this manner it has extended back from the sea for a distance of nearly forty miles. The insect has been abundant for a number of years at Berlin, Mass., where large quantities of asparagus are grown for the Boston market, and it has made its way along the coast to Portsmouth, N. H., and up the Merrimac river to Nashua, N. H. It may also enter both New Hampshire and Vermont through the Connecticut valley, besides touching the southern coast of Maine.

In this State the common species occurs over all Long Island. It has been traced up the Hudson river valley as far as Mechanicsville, about twenty miles north of Albany. It occurs in a number of widely separated localities in the western central portion of the State, having been reported from the following places: Vernon, Oneida county; Oswego, Oswego county; Newark, Wayne county; Geneva, Ontario county; Genesee, Livingston county; Rochester, Monroe county; and Buffalo, Erie county. The insect will probably spread to all parts of the State lying within the Upper Austral Life-zone (see Plate IV in my 11th Report). It is known in nine counties in the northeastern part of Ohio, and is now slowly spreading over that State. The twelve-spotted species may be expected to eventually occupy a not much less extended range of territory.

Remedies.

The methods of value against the common asparagus beetle will be found of service in fighting this insect under similar conditions. The larvæ of the twelve-spotted form feed in the berries the latter part of the season, and are then out of reach of the common insecticides, but when feeding on the foliage they can be destroyed by dusting air-slacked lime over the plants when still wet with dew. The beetles can be poisoned upon the foliage with Paris green or arsenate of lead. If the insects are very abundant during the cutting season, it may pay to allow portions of the field to grow up and serve as lures to attract the beetles from the young shoots, where they may be poisoned.

Galerucella luteola* (Müller).The Elm-Leaf Beetle in Albany and Troy.*

(Ord. COLEOPTERA: Fam. CHRYSOMELIDÆ.)

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- BECKWITH: in 6th Ann. Rept. Del. Agricul. Expt. Stat., 1893, pp. 166-167 (brief notice, as *G. xanthomelæna*).
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In the preceding Report, the observed progress was given of the elm-leaf beetle along the Hudson river from Newburg northward until it reached Albany in 1892, and its subsequent spread in a portion of the city. It is proposed in the present article, to present some additional observations made upon this insect, which, from its serious injuries to a favorite shade-tree, is exciting much interest.

This insect was very destructive the present year to the foliage of the English elms (*Ulmus campestris*) in both Albany and Troy. A second brood of the beetle was observed in 1895, but, owing to absence from town, it was impossible to make the continuous observations upon it desirable. The present year an effort was made to settle some of the disputed points concerning the habits of the insect so far north. Two annual broods were known to occur in the southern part of New Jersey, while, according to the observations of Dr. Smith in successive years, the insect was limited to a single brood at New Brunswick, in the northern part of the State. On this account it had been taken for granted that but a single brood would develop further north, and observations made by Dr. Howard in Connecticut in 1895, seemed to confirm this belief. It was, therefore quite a surprise when, beyond question, two well marked broods were observed by me in Albany in 1895, and a small third one the present year (1896). Instead of retiring in midsummer to hibernating quarters, there to remain until the following spring, as at New Brunswick, the beetles continued their feeding and oviposition so late in the season that larvæ were to be found so long as any leaves remained suitable for their food.

Broods in 1896, in Albany.

The larvæ of the first brood, those from eggs deposited by the overwintered beetles, were observed descending the trees for pupation on June 19th. On the 22nd a number of the pupæ were collected. The first beetles of this lot appeared the 30th, and by July 7th they had all transformed.

Most of the English elms in the vicinity of South Hawk street, Albany, were completely defoliated by the first brood. A close watch of this district was maintained throughout the remainder of the season. July 11th a cluster of eggs was found on the large lower leaves of one tree. Unfortunately the tops of the tall trees were so inaccessible as to make their close observation impracticable. It is probable that numbers of eggs were laid on the foliage of the higher branches during the month of July, as eggs were found from day to day on the rather fresh lower leaves at a time when the upper appeared to be in even better condition.

On South Hawk street, an English elm, which had been defoliated by the first brood, was throwing out a fresh crop of leaves July 30th. This recent growth was abundantly infested with both eggs and young larvæ. August 11th, eggs and larvæ were still abundant on this tree, although its foliage was almost entirely destroyed, while at its base many larvæ and a number of pupæ were seen. Two days later the pupæ were more abundant. August 21st this tree began to throw out a third crop of leaves, and most of the pupæ at its base had transformed. This new growth was but little injured, although a week later other trees in its vicinity were found to have been recently infested. These latter larvæ may have been portions of a third brood.

A striking example of the work of the second brood and the continued breeding of the insect until late in the autumn was observed on Washington avenue about three blocks above the Capitol. A number of English elms, which had been but slightly attacked last year and had suffered very little by the first brood. the present year, were badly injured by the second. Many of the leaves were skeletonized in mid-summer, and August 19th pupæ were lying abundantly around the trees. Pupæ continued to be found in large numbers until after the middle of September, and in lessening numbers until November 1st. Larvæ were to be found as late as October 15th.

On Lancaster street, near Lark, there are several English elms which had suffered little injury during the summer. Much to my surprise, hundreds of full grown larvæ were on the walk beneath the trees on October 12th. Their abundance so late in the season in such numbers render it quite probable that they belonged to the third brood, rather than that they were belated individuals of the second.

Observations in Troy.

The occurrence of two, and probably, of three, broods was even more conclusively shown by the observations made at Troy, N. Y. On Eagle street in that city, there is a row of small English elms, which when first visited on August 18th presented a sad sight. Every leaf had been skeletonized, and there were only the dried remains of what had been a luxuriant foliage. In other parts of the city the trees had given out new leaves, which were badly infested with eggs. Eleven days later, the new leafage on Eagle street was already badly infested with eggs and recently hatched larvæ. Four egg clusters were counted on a small twig bearing but five leaves. September 9th there were many young larvæ and a few nearly full-grown, and numerous egg clusters — on a

single leaf there were six. A week later the new foliage had suffered severely. Four or five larvæ were commonly found on a small leaf. Most of them were about half-grown, and a few were full-grown. September 25th many larvæ and a few pupæ were found on the trunks of the trees. A number of half-grown larvæ and some beetles were feeding on the leaves. October 1st a few larvæ were feeding; full-grown ones and numbers of pupæ were seen on the trunks and at the base of the trees, and beetles were feeding on the leaves. On the 22d of October several young larvæ were seen on a bunch of the greenest leaves, and near them a cluster of egg shells from which they had probably emerged within a few days. October 31st several full grown larvæ and a pupa were found at the base of one tree, and also a beetle just completing its transformations. On one tree with exceptionally green leaves, a number of very small larvæ were seen, and near them a cluster of egg shells. At this time most of the English elms were leafless. One week later, November 7th (the last observation for the season), a few pupæ were still to be found, which transformed successfully to beetles. The above facts indicate most clearly that the beetles would continue reproduction so long as there was suitable food. It also seems reasonable to refer the latest larvæ and pupæ to a limited third brood, rather than to the progeny of belated individuals of the second brood.

Notes on Oviposition and Transformations.

In connection with observations of the beetle in nature, breeding experiments were also attempted. Owing to the difficulty of obtaining new leaves for the larvæ, they were not so successful as could be desired.

On the 6th of July a large number of recently transformed beetles were confined with fresh, though old, elm leaves. They fed so voraciously that a new supply was furnished them every two or three days; especial care was taken to introduce no eggs with the food. Egg clusters were found as follows: 1 on the 8th; 4 on the 11th; 1 on the 13th; 3 on the 14th; 2 on the 16th; 15 on the 18th; 9 on the 21st; 3 on the 23rd; and 2 on the 25th,—the oviposition having extended over seventeen days. Most of the eggs were deposited in normal clusters and were fertile, although the conditions in the cage were not quite normal. From the above data it would appear that in summer most of the eggs are laid 12 to 14 days after the perfect form is assumed.

At this time tender leaves could not be obtained, and the young larvæ, under the ordeal of their confinement, perished a few days after emerging

from the eggs. Some recently hatched larvæ were found on a tree July 30th, and were successfully reared to the pupa — one assuming that form August 11th and others a few days later. Young larvæ taken on a tree September 9th, pupated October 7th. The eggs and larvæ of this insect on a leaf are represented in figure 1 of plate VIII,—in the lower left-hand corner an egg cluster is shown enlarged.

The duration of the egg stage in July averaged about 5 days, that of the larva 15 to 20 days, and of the pupa 7 days. In the autumn, as might be expected, these periods are considerably prolonged by the colder weather. In September, the pupa stage was observed to last 12 days, and in October twice as long.

The duration of the beetle's existence is also of interest since it has a bearing on the probability of the occurrence of a third brood. A record of the mortality of those confined in a cage July 6th (see above) was kept, which is as follows: 7 dead the 16th; 4 the 18th; 5 the 21st; 2 the 23rd; 15 the 25th. Most of those that died the 23rd or before were badly affected with a fungus, *Sporotrichum entomophilum* Peck, and many of them may have been killed by it. The death of the others may have been hastened by the unnatural conditions of confinement. As but few of the beetles died before most of the eggs had been laid, it is probable that they live but a short time after having provided for the perpetuity of the species.

Although eggs and larvæ were not obtained from individuals known to belong to the second brood, yet the rearing to the pupa and imago stages, of those collected abroad as cited above, show conclusively that there was ample time for three generations during the activity of the insect. The beetles were seen feeding the latter part of August, during September, and even into October, and eggs, or evidences of recent oviposition, existed throughout the time. The limited life of the beetles after oviposition observed in July, renders it most probable that the same was true later in the season. From the preceding, there is hardly room for doubt that there was a genuine third brood of the insect in Albany and Troy the present year.

Food-Habits of Larvæ and Beetles.

Some of the young larvæ obtained from eggs in July were fed with the greenest of the old leaves that could be obtained. Everyone of several lots died after a few days, and then it seemed as if they were unable to develop upon the old growth. August 11th, some half and some nearly full grown larvæ were placed on old leaves. They at once began feeding,

and eventually matured. The next day some recently hatched ones found on a tree were transferred to an old leaf, and a fair proportion of them completed their transformations. That the larvæ actually mature on old foliage is rendered certain by the development of a large second brood on a number of trees which had been scarcely injured by the first brood, and by the continued breeding of the insect on them until late in the autumn, as recorded before. A leaf skeletonized by the larvæ is shown in figure 4. Many trees had nearly every leaf as badly eaten as the one photographed.

The ravages of the second brood of beetles in Capitol Park on the American elms (*Ulmus Americana*) was much more marked than of the one earlier in the season. One tree was nearly defoliated, and large portions of adjacent ones. The injury to American elms in other parts of the city was comparatively slight, so far as observed, although they were in close proximity to badly infested English elms.

The larvæ, under certain circumstances, may play the part of cannibals.

In one instance, when food had not been given them in three days and all the leaves had been eaten, — upon opening the box containing them, a larva was seen devouring a living pupa: it had already eaten away a large portion of the dorsal wall of its thorax.

The beetles, as before noted, are ravenous feeders before oviposition—commonly eating large holes in the leaves. In one case observed August 31st, they had been skeletonizing an old leaf in a manner very similar to that of the young larvæ. The leaf was unusually dry and somewhat dusty, and its unpalatable condition may have been the cause of the departure from their ordinary feeding habit.



FIG. 4.—Work of elm-leaf beetle larvæ.

Spread of the Insect in Albany.

The area occupied in numbers by the first brood of the insect the present year corresponded quite closely with the thickly infested area of

1895. It would only be necessary to extend the lines indicated in 1895 a few blocks westward and northward to have the two areas coincident. The badly infested area in 1896 was the southern portion of the city bounded on the north by State street, on the west by Dove street, and on the south by Beaver Park. A limited infestation was noticed in the vicinity of North Hawk street and Clinton avenue.

The second and third broods materially extended the thickly infested area. The westward extension is to Lark street, but in Lancaster, reaching almost to Washington Park. The large second brood on the Washington avenue trees, hitherto practically free from the pest, defines the northwestern limit at the corner of Lark street and the avenue. The defoliation of trees in Capitol Park and on the streets lying off North Hawk street, indicates a northern extension of the insect which is virtually limited by Third street, and easterly and westerly by North Pearl and North Swan streets respectively.

The slow spread of the insect is in accordance with the partial migratory habit recorded by Dr. Riley, although signs of its presence in limited numbers are to be found over a much larger portion of the city than indicated above—practically the greater portion.

Ravages in Albany.

The ravages of this insect in Albany the present year were very severe. In the southern portion of the city, where the insect has been established for several years, almost every English and Scotch elm was defoliated at least once, and a number suffered the loss of their second leaves. The early part of the season, a number of fine trees had died and were removed. Apparently, it only requires three or four years of successive defoliation to kill the elms. A row of nine, on South Hawk street, formerly splendid specimens of the English elm, are nearly ruined and will probably die the coming season. The American elms were severely injured in some places, several having been nearly defoliated during the latter part of the summer. The injuries to this native species are on the increase, as is evidenced by the large number that have been attacked. It is safe to estimate that over two hundred fine elms in the southern residential portion of the city have already been killed by this pernicious pest. From present indications, it is only a question of time when the European elms will be destroyed and the American elms seriously injured, unless the insect be checked in its destructive course, by effective action of the citizens of Albany or its civic authorities.

Injuries in Troy and Vicinity.

The neighboring city of Troy, N. Y., six miles northward of Albany, was visited August 18th for the purpose of observing the operations of the elm-leaf beetle there and in the vicinity. It was found that the foliage of most of the English elms throughout the city had been completely skeletonized by the larvæ of the first brood. From the western end of Hyland avenue, commanding a view of a large portion of the city, the brown, dead leaves could be seen in all directions, and gave the impression of an extensive destruction by fire.

A closer examination of the condition of the English and Scotch elms throughout the city, showed that the infestation and consequent damage was fully as great as appeared from a general view. The elms everywhere were seriously injured, and in most instances the first crop of leaves had been completely destroyed. It was learned that the insect had been in the lower part of the city for years past—at least three. From this it would appear that the beetles must have entered Troy in 1892, and possibly earlier. The city had certainly suffered more from the insect the past year than had Albany.

The most badly infested region in Troy was between the Hudson river on the East and Fifteenth street on the West, extending from near the southern boundary of the city to Hoosick street on the north. The southern end of Green Island and, on the western bank of the river, a large portion of the city of Watervliet (formerly West Troy), was also badly infested. The insect was found in limited numbers on the high lands east of Troy, along Tibbets avenue, at Albia, and at Averill Park in the town of Sand Lake, some seven miles southeast of the city. On the north and west of Troy, signs of it in limited numbers were seen over most of adjoining Lansingburg, and in portions of Cohoes and Waterford on the opposite side of the river. It had become established at Menands, half way between Albany and Troy, in considerable numbers. It had also been found by Dr. L. O. Howard, Entomologist to the U. S. Department of Agriculture, at Mechanicville, about ten miles north of Troy.

Associated Insects.

The elm-leaf beetle finds a very efficient ally in its destructive work in the European Coccid, *Gossyparia ulmi* (Geoff.), which is widely distributed over Albany, Troy and Watervliet. The insect was so numerous on many trees that the leaves and branches were blackened by the fungus growing in its abundant secretion to such an extent as to render them conspicuous at a distance. Its occurrence in such numbers must weaken

the trees to a considerable extent in the course of time. For a more extended notice of this insect see subsequent pages of this report (XII).

The injured and dying elms were also attacked by the pigeon Tremex, *Tremex columba* (Linn.), in numbers both in Albany and Troy. Many of the trees showed numerous large holes made by the Tremex larvæ. On the trunk of one small tree, two dead females were held by their inserted ovipositors, and, at the base of the tree, the remains of four others were found. The parasites of the Tremex were also active. One female of *Thalessa lunator* (Fabr.), "the lunate long-sting," was taken while ovipositing in the trunk of an infested tree. The remains of thirteen ovipositors securely fastened in the trunk of one small infested tree were eloquent testimonials to the activity of *Thalessa* in its search for the Tremex larvæ.

Natural Enemies.

The elm-leaf beetle has so few natural enemies that they do not appear to thin its ranks materially. A number of dipterous maggots were found among a mass of larvæ and pupæ collected at the base of a tree. There was no evidence that they attacked the living forms, yet more occurred than one would naturally suppose could find sustenance in the small amount of decaying matter present. Unfortunately they were not brought to maturity, and the species could not be determined.

Podisus spinosus (Dallas) was detected with a half-grown larva of the elm-leaf beetle on its extended beak, and it was also reported from Poughkeepsie as preying on the insect. A larva of a lace-wing fly, *Chrysopa*, was found in the vicinity of some dead larvæ of the elm-leaf beetle, and it was thought that possibly this was another of its predaceous enemies. A mite was noticed near some injured eggs, but it escaped before its identity could be established or its relation to the mischief ascertained.

Many of the beetles were killed by a fungus. It affected numbers of them in the breeding cages, and on some trees clusters of beetles would be found filled with it. Examples were submitted to State Botanist Peck, who has described the fungus as a new species in his report for 1896 under the name of *Sporotrichum entomophilum*. Like the disease affecting the chinch bug, caused by *S. globuliferum* Speg., that of the elm-leaf beetle can not develop rapidly in the absence of moisture. The affected beetles were found only where there was abundant moisture, as for example, in damp crevices in the trunks of the trees, in masses on damp ground and in moist breeding cages. The necessity of moisture to the development of *Sporotrichum entomophilum* Peck, renders the disease of doubtful value as a check on the undue increase of the elm-leaf beetle.

Remedies.

The proper and most satisfactory method of dealing with this insect is by spraying with the arsenites (one pound Paris green to 200 gallons of water) when the recently hatched larvæ are beginning to feed, as has been frequently pointed out before. Unfortunately for the general adoption of this means, the machinery necessary for spraying large trees is so expensive as to place it beyond the reach of many. Where a large number of the shade trees in a city are to be treated, some form of a steam apparatus for spraying appears to do the work with the greatest efficiency and economy. Although the machinery may be expensive, the cost of spraying per tree is by no means large. The abundance of the elm-leaf beetle in various cities has forced the authorities to resort to efficient means for protecting the trees. The cities of New Haven, Conn.; Springfield and Holyoke, Mass.; and Brooklyn, N. Y., have had constructed various successful forms of steam sprayers. Some difficulty was experienced in using the machines in these cities, either on account of their large size or the noise made by them while in operation. In New Haven it was found necessary to close the street during the spraying to avoid frightening the horses. Among the best of these may be mentioned the spraying apparatus constructed under the supervision of Dr. E. B. Southwick for the department of public parks of the city of New York. It consists of a "Diamler" gasolene motor connected with a three-piston Gould pump, the latter the smallest size of that pattern. The motor and the pump weigh about 300 pounds. The whole can be placed in a spring wagon with a 100 gallon, or larger, tank. The motor costs \$250, and the pump about \$50. The machine can be operated at the cost of but a few cents a day and makes so little noise when running as to scarcely attract the attention of passing horses. This apparatus will probably be found much more satisfactory than any makeshift, although it involves a greater outlay at first. For description of this apparatus, see the excellent paper by Dr. L. O. Howard on "The use of steam apparatus for spraying," in the Year Book of the U. S. Department of Agriculture for 1896, pages 69 to 88, from which the preceding has been taken.

There are now, and probably will be, a number of cities and large villages where this pest is prosecuting its destructive work, and where those in authority will not take the steps necessary for protection against it. In such localities there is an opportunity for some enterprising individual to fit up the proper apparatus and contract with property owners for spraying their trees either at so much a tree, or at so much for the season.

This has been done already in some places. At Bridgeport, Conn., Mr. W. S. Bullard has engaged in such work for the past few years. The firm of H. L. Frost & Co., 21 South Market St., Boston, Mass., is making a speciality of all kinds of spraying and of pruning trees. The members of this firm are graduates of the Massachusetts Agricultural College and deserve encouragement in this comparatively new line of work. Where no provision has been made for spraying, or where it has been carelessly done, the larvæ and pupæ that may be found on the trunk and at the base of the tree should be destroyed with hot water or kerosene emulsion. Many of the insects can be killed in this manner, but only after they have ceased feeding. This measure simply reduces the number of the insects of later broods. It may be made more effective by scraping the rough outer bark from the lower limbs and the trunk of the tree so that a larger proportion would be compelled to descend to the ground in search of a hiding place while transforming instead of pupating within the crevices of the bark. A rude inclosure or box around the base of the tree would also be of service, as it would keep the larvæ from straying where they could not be so easily reached and killed.

***Odontota dorsalis* Thunb.**

(Ord. COLEOPTERA: Fam. CHRYSOMELIDÆ.)

- *dorsalis* THUNBERG: Götting. Gel. Ang., 1805, p. 282.
Chrysomela scutellaris OLIVIER: Ent. Hist. Nat.—Coleopt., vi, 1808, p. 771, Pl. 2, fig. 21.
Hispa suturalis HARRIS: in Bost. Journ. Nat. Hist., i, 1835, p. 147 (pupa [Fig. 2] and imago described); Ins. Inj. Veg., 3rd Edit., 1862, p. 121 (description).
Anoplitis scutellaris. FITCH: 5th Rept. Ins. N. Y., 1859, p. 54 (brief notice of larva and imago); the same in Trans. N. Y. State Agric. Soc. for 1858, xviii, 1859, p. 834; in Country Gent., xxvi, 1865, p. 190 (ravages on Long Island).
Hispa suturalis. PACKARD: Guide Study Ins., 1869, p. 504 (mention).
Odontota scutellaris. RILEY: in Amer. Entomol., iii, 1880, p. 151 (on *Robinia* and *Quercus alba*).
Anoplitis scutellaris. LINTNER: 1st Rept. Ins. N. Y., 1882, p. 320, (cites Fitch).
Odontota dorsalis. HORN: in Trans. Amer. Entomolog. Soc., x, 1883, pp. 296, 303 (description and synonymy).
Odontota scutellaris. DIMMOCK: in Kingsley's Stand. Nat. Hist., 1884, p. 315 (not confined to the locust).
Odontota scutellaris. HOWARD: Bull. 5 Divis. Entomol., U. S. Dept. Agric., 1885, p. 7 (parasite from pupa described).
Odontota suturalis. HOWARD: in Entomolog. Amer., i, 1885, p. 117 (two parasites described).

- Odontota scutellaris*. PACKARD: 5th Rept. U. S. Entomolog. Comm., 1890, p. 367 (in New England).
Odontota dorsalis. HOPKINS: Bull. 16 W. Va. Agricul. Expt. Stat., 1891, p. 87, Pl. 13, fig. 1, *a-d*; in Canad. Entomol., xxviii, 1896, p. 248 (food-plants, destructive in W. Va).
Odontota suturalis. LINTNER: 10th Rept. Ins. N. Y., 1895, p. 369 (parasitized by *Derostenus*).
Odontota dorsalis. LINTNER: 11th Rept. Ins. N. Y., 1896, p. 269 (on apple).
Odontota dorsalis. BLATCHLEY: in Psyche, vii, 1896, p. 437 (in Indiana).
Odontota dorsalis. CHITTENDEN: in Bull. 9 New Ser., Divis. Entomol., U. S. Dept. Agricul., 1897, pp. 22-23 (herbaceous food-plants).
Odontota dorsalis. WEBSTER: in Bull. 74 Ohio Agricul. Expt. Stat., 1897, p. 35 (abundance in Ohio and Kentucky).
Odontota dorsalis. WICKHAM: in Canad. Entomol., xxix, 1897, p. 60, fig. 10 (in Canada).

This insect, although quite abundant at times in certain localities, had not occurred in the collections made by me in Albany and Schoharie counties, or in occasional collecting in other portions of the State. From the abundance with which it is reported below, upon the locust, it may have been overlooked by me in my limited examinations of the insect fauna of that food-plant. Dr. Fitch, writing in 1858, stated that he had never met with it in the eastern part of the State, although common in the southern.

The Insect on Long Island.

Examples were received by me on August 31, from Dr. Harrison G. Dyar, which had just been taken by him from locust trees (*Robinia*) at Yaphank, L. I. The leaves had been eaten (Pl. VIII, fig. 2) until they bore the appearance of elm leaves attacked by the elm-leaf beetle, and as the result of the severe injury, the foliage was rapidly falling.

In a re-examination of the trees by Dr. Dyar a week later—a roadside row of about twenty in number and patches of locust shrubs in a woods opposite—all the remaining foliage had turned brown. To the east and the west of this locality only a slight injury was noticeable, while to the northward, in another row of locusts between two fields, the leaves were still green and apparently uninjured.

In West Virginia.

Dr. A. D. Hopkins has written on the abundance and injuries of this Chrysomelid as observed by him in 1890, at Morgantown, W. Va., and its vicinity. In his bulletin on "Insect Ravages—Yellow Locust" (*sup. cit.*), he has stated as follows:

"This beetle was extremely plentiful on the locust leaves at the time the investigation was being made (early August),—as many as eight or

ten were frequently found on a single leaf. They probably appear in May or June, when they deposit their eggs on the under side of the leaves, which hatch into small grubs that burrow into the leaves and feed upon the substance beneath the surface, forming blisters near the edges which usually extend to the midrib. * * * They change within the blister to the pupa form, from which the beetles soon emerge and feed on the surface of the remaining unaffected leaves. The blisters formed by the larvæ and the leaves skeletonized by the beetles, * * * cause the leaves to turn brown, wither and fall. * * * The beetle was also taken feeding on the leaves of the locust at Morgantown, on June 10th, and at Kanawha Station on June 16th.

"Like the plum curculio, it is the habit of this beetle to fall to the ground when alarmed, and in the case of valued shade trees, it may be possible to destroy them by the jarring process which is successful with the curculio. Their habit of feeding on the upper surface of the leaves would make it easy to treat them by spraying the trees with poisoned liquid."

Food Plants.

Although the locust is the natural food-plant of this insect, it seems not to be entirely confined to it, for Dr. Dimmock has reported it as extending its devastation to a number of other trees.

A correspondent of the American Entomologist (Vol. iii, p. 151), represents it as devouring the advanced foliage of Siberian crab-apples in the first week of May, and "in the wild woods, the tender leaves of *Ulmus Americana*." Finding insufficient food in the mined *Robinia* leaves, they attack the young leaves of red-oak (*Quercus rubra*), leaving other species of oaks near by, untouched. Mr. Hopkins (*loc. cit.*) found the insect feeding on the foliage of white oak, beech, birch and hawthorn in West Virginia, and Mr. Chittenden (*l. c.*) records instances of their feeding on red clover, hog peanut (*Falcata comosa* which is the *Amphicar-pæa monoica* of Gray's Manual) and soja beans.

Dr. Harris' Account of the Insect.

According to Dr. Harris, the beetles may be found pairing in Massachusetts, in the middle of June and laying eggs on the leaves of the locust trees which are transformed to the perfect insect in August. "They measure nearly one-quarter of an inch in length, and are of a tawny yellow color, with a black longitudinal line on the middle of the back, partly on one and partly on the other wing-cover, the inner edges of which meet together and form what is called the suture; whence the species was named *Hispa suturalis* by Fabricius; the head, antennæ,

body beneath, and legs are black; and the wing-covers are not so square behind as in the rosy Hispa." (Pl. VIII, fig. 3.)

The Larva.

The larva has been briefly characterized by Dr. Fitch as — "a small, flattened, whitish worm, attaining a quarter of an inch in length, tapering from before backwards, with projections along each side like the teeth of a saw, and with only three pairs of feet, which are placed on its breast; eating the parenchyma and leaving the skin of the leaf entire."

Parasites.

Several species belonging to the large parasitic family of *Chalcididae* have been reared from this insect by Dr. Riley, and described at his request by Dr. Howard. *Spilochalcis* [*Smicra*] *odontota* Howard, was reared from the pupa of this locust feeder. *Sympiezus uroplata* Howard feeds externally on the larva within its mine. *Trichogramma odontota* Howard, is an egg parasite issuing in July. *Derostenus primus* Howard MS., was reared from the leaf mine of *Odontota*. Dr. Howard thinks it may be a secondary parasite, preying upon either of the first two species (*loc. cit.*).

Distribution.

Dr. Horn has given the distribution of this insect as, "Middle and Southern States." Dr. Packard records it from New England, Middle and Western States. Prof. Webster has mentioned defoliations by it (more or less complete) in southern Ohio and adjacent parts of Kentucky.

Balaninus proboscideus (Fabr.): Balaninus rectus Say.

The Chestnut Weevils.

(Ord. COLEOPTERA: Fam. CURCULIONIDÆ.)

FABRICIUS: Ent. Syst. em., tom. i, pars ii, 1792, p. 440, No. 193 (description, as *Curculio proboscideus*).

SAY: Descript. N. Amer. Curculionides, 1831, p. 16; Compl. Writ., LeCont. Ed., i, 1883, p. 279 (original description of *Balaninus rectus*).

GLOVER: in Rept. U. S. Dept. Agricul. for 1870, 1871, p. 70, fig. 13 (*B. rectus* injuring chestnuts, life-history in brief).

PACKARD: 2nd Ann. Rept. Ins. Mass., 1872, p. 17, figs. 10, 11 (weevils in chestnuts); 5th Rept. U. S. Entomolog. Comm., 1890, pp. 215-216, fig. 69 (*B. rectus* in acorns), pp. 350-352, fig. 132 (brief account of *B. caryatrypes* [*proboscideus*] in chestnuts), p. 354 (*B. rectus* in chestnuts).

- RILEY: in Canad. Entomol., iv, 1872, p. 19 (*B. uniformis* erroneously referred to *B. rectus*); 4th Rept. Ins. Mo., 1872, p. 144 (injury, life-history in brief of *B. rectus*, probably *B. uniformis*).
- HORN: in Proc. Amer. Philosoph. Soc., xiii, 1873, pp. 457, 458, 459 (describes *B. caryatrypes* and *B. rectus*, table of species).
- BLANCHARD: in Bull. Brook. Entomol. Soc., vii, 1884, p. 107 (table of species; *B. caryatrypes*, *rectus* and others).
- HAMILTON: in Canad. Entomol., xxii, 1890, pp. 1-3, 7 (habits, distribution, parasites of *B. caryatrypes* [referred to *B. proboscideus*] and *B. rectus*); in Insect Life, iv, 1891, p. 130 (*B. proboscideus* and *B. rectus* commonly infesting chestnuts and chinquapins) p. 131 (larval habits of *B. proboscideus*).
- LINTNER: 7th Rept. Ins. N. Y., 1891, p. 383 (mention); in Country Gentleman, lix, 1894, p. 504 (brief mention); 10th Rept. Ins. N. Y., 1895, pp. 501, 517 (mention, all referred to *B. caryatrypes*).
- RILEY-HOWARD: in Insect Life, iv, 1891, p. 93 (*B. proboscideus* and *B. rectus* reared from chestnuts and chinquapins, notes on habits).
- MCCARTHY: in Bull. 105 N. C. Agricul. Expt. Stat., 1894, pp. 267-272, fig. 1 (injuries by chestnut weevils, general account of *B. proboscideus*).
- SMITH: in Rept. N. J. Agricul. Expt. Stat. for 1893, 1894, pp. 481-485 (general account of *B. proboscideus* and *B. rectus*); Econom. Entomol., 1896, p. 236, fig. 243 (*B. rectus* figured).
- COMSTOCKS: Manual Study Ins., 1895, p. 593 (*B. caryatrypes* and *B. rectus* mentioned).
- SARGENT: in Gard. Forest, viii, 1895, p. 8 (brief account after Smith).

"Wormy chestnuts" are familiar to all lovers of this favorite nut, although few can recognize the parent weevil of these unwelcome grubs. In some seasons the chestnuts are so seriously infested that a large proportion of the crop is rendered worthless by their attack. It not infrequently happens that a lot of chestnuts are stored in some box or vessel soon after gathering and are found a few weeks later badly infested and sometimes almost destroyed by the white grubs or larvæ of these weevils.

Chestnuts as a Market Crop.

The growing of these nuts for market is an industry that is yet in its infancy in this country, but it is one of considerable extent and may be expected to develop to a much greater degree in the future. There are many acres in this and other States now almost unproductive, which are capable of producing large crops of the nut at a slight expense. Great quantities of Spanish nuts are imported from year to year, although equally good, if not better, ones can be grown here. As an instance of what has been done along this line — the twenty acres of bearing Paragon chestnut trees of Mr. H. M. Engle, Marietta, Pa., may be mentioned. Native trees were cut on a steep hillside and the sprouts grafted to

this improved variety,— the grafts beginning to bear when about three years old. The trees were kept properly trimmed and the ground clear from underbrush. The land now yields more in value than an equal area of potatoes and at a much less expense. The improved varieties being easily grafted on native stock, makes it easy to transform in a few years comparatively worthless trees to valuable fruit producers. The most serious drawbacks are the underbrush, injury by insects, and thieves.

Extent of Injury by Chestnut Weevils.

The amount of injury by these insects varies much both with the season and the locality. Mr. R. C. Hewson, Penn Yan, N. Y., estimates the annual loss of native nuts in that vicinity at from five to ten per cent of the crop. This appears to be rather a conservative estimate, since in Massachusetts as high as forty per cent of the chestnuts in certain seasons are injured by these weevils. Sometimes in New Jersey fifty per cent of the Japanese and Spanish varieties are ruined, and Dr. Smith cites an instance in which the crop was almost entirely destroyed at the Parry Brothers nursery. The loss in Maryland ranges from ten to twenty-five per cent, in Delaware from thirty to forty, and in North Carolina from ten to fifty—possibly averaging, about twenty per cent. From five to twenty-five per cent of the few native nuts in Michigan are injured by the weevils.

The Genus *Balaninus*,

This genus is remarkable among the *Curculionidæ* or snout beetles for the unusually long proboscis or snout, — it being rarely shorter than the body, and in the female it is frequently twice the length. The members of this genus feed in the larval state on chestnuts, walnuts, hickory nuts and hazelnuts — all having thick husks and hence necessitating a very long beak for the purpose of perforating to the kernel that the eggs may be deposited near a suitable food supply. The extremely long beak may well be regarded as a special adaption to the requirements of the existence of this genus. It also differs from the other *Curculionidæ*, and in fact from all other known Coleoptera, by having the mandibles vertical instead of horizontal. The structure of this form is so different from its allies that it has been raised to sub-family rank (LeConte-Horn: *Rhynchophora of America*, 1876, p. 322).

Two Species Attacking Chestnuts.

There are at least two species that injure chestnuts in this country. The great chestnut weevil, *Balaninus proboscideus* (Fabr.), formerly known as *B. caryatrypes* Bohm., is the larger. This form may be separated from the

other American species of this genus by the first joint of the antenna being shorter than the second. It is beautifully variegated with fuscous lines and spots interspersed among the dense clothing of ochreous scales on the thorax and wing-covers. Some examples are entirely ochreous. The beak of the female varies in length from one and one-fourth to twice the length of the body. Its distribution has been given as follows: Massachusetts, New Jersey, Pennsylvania, District of Columbia, North Carolina, West Virginia, Ohio, Illinois, Tennessee, Middle States westward. Other localities are recorded by McCarthy for chestnut weevils, but the species are not indicated. The smaller chestnut weevil, *Balaninus rectus* Say, has a wider recorded distribution, as follows: Canada, Massachusetts, New York, New Jersey, Pennsylvania, District of Columbia, Virginia, West Virginia, Ohio, Southern States and Arizona. Besides the above, chestnut weevils have been reported from Delaware, Maryland, Georgia, Michigan and Missouri, but without having been referred to either species. Possibly each of the species may have a distribution over the United States co-extensive with its chosen food.

B. rectus varies in size from about one-sixth to one-third of an inch in length. The general color of the scales and hair is light brown above, paler below; on the thorax there is a dark brown discal stripe, which is limited at the sides and divided longitudinally by a pale yellow line. The elytra are variously marked with the same color. The beak of the female is very long, being equal to or even longer in proportion than in *B. proboscideus*. The long beak and the long conical thorax is said to distinguish *B. rectus* from the other species of the genus. The male is not so easily recognized: "It has a shorter thorax, but it is still narrowed anteriorly; this, with small femoral tooth, oval elytra rapidly narrowed from base, and a yellowish or brownish spot of condensed scales on each side of the central line of the metasternum (occasionally obsolete), will, with practice, distinguish it." (Hamilton.) (See Pl. VIII, figs. 4, 6.)

Life-History.

The life-history of these two species agrees quite closely, so far as known. The weevils of *B. proboscideus* appear about the time of the blossoming of the chestnut trees,—this being variable in the different latitudes, and oviposit in the young burrs. The long beak of the female is used to pierce the husk to the kernel, and one or more eggs are then deposited therein. The slight injury done the burr and the nut at this early period of its development soon heals and shows no indication of the grub within as it comes to maturity. The holes noticed in "wormy

chestnuts" are made for the exit of the larva (Pl. VIII, fig. 5). The female lives but a short time;—a week or two at the most. All of the larvæ of this species enter the ground in the autumn, none wintering in the nuts although thought probable by some writers.

The adults of *B. rectus* appear also about the time of the blossoming of the chestnuts. When rearing this species, Dr. Hamilton found that its appearance in the breeding cage was much more irregular than was that of the preceding, — varying from June 28 to October 1. On the latter date, there were in the cage pupæ in various stages and many larvæ that would doubtless live over the approaching winter. A delay until the second season is quite common in this species and is one of nature's safeguards against extermination should there be an entire failure of the crop in any one year, as happens occasionally. The preceding species has been reared only from chestnuts, while *B. rectus* is known to breed also in chinquapin nuts and açorns. This diversity of food habit in *B. rectus* may account in part for the marked irregularity of the appearance of the weevils. There appears to be no record of *B. proboscideus* remaining over until the second year in the pupa state, although it is probable that such instances occur. The method of oviposition of the smaller weevil appears to be practically the same as in the larger species.

Urosigalphus armatus Ashm., is the only known parasite of this genus, having been reared from all the species except *B. obtusus* Blanch.

Remedies and Preventives.

It would not be worth while to attempt to prevent oviposition in the growing nuts by poisoning the weevils, even if practicable, on account of the labor involved. Moreover, it has not been shown, as in the case of the related plum curculio, *Conotrachelus nenuphar*, that these weevils could be killed in this manner. Their short adult existence in comparison with that of the plum curculio would lead one to doubt the efficacy of any such measure.

The best methods of controlling these insects will be in preventive measures. All infested nuts should be destroyed each year before their occupants have had opportunity for leaving them and entering the ground for their transformations. When the nuts are not picked from the trees they should be gathered as soon as they fall and tested by turning them into a vessel of water, when, by brisk stirring, most of the wormy ones, being lighter than the liquid, will float to the surface and may easily be removed and destroyed. The others should be taken from the water and after drying, placed in a tight receptacle until shipped,

so that if there are still infested nuts, the grubs can not leave and enter the ground and continue their attack another year. A more thorough treatment would be to subject the nuts in a tight room or box to the fumes of carbon bisulphide for about twenty-four hours, using one pound of the carbon bisulphide in shallow vessels to each 1,000 cubic feet of space. Fire must be kept away from this chemical as its fumes are inflammable and explosive. The nuts will not be injured by this treatment.

Jarring the trees has been found very effectual with the plum curculio, and it should be of equal value against these weevils, while requiring fewer repetitions, owing to the shorter period of oviposition. By visiting the trees each morning and catching the weevils as they fall upon a broad sheet prepared for the purpose, for the short space of a week or two, the crop would be comparatively free from these pests. Oaks and wild chestnuts should be as remote from the cultivated ones as possible, that they may not serve the insects for breeding purposes.

***Cicada septendecim* Linn.**

The Periodical Cicada.

(Ord. HEMIPTERA : Subord. HOMOPTERA : FAM. CICADIDÆ.)

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The appearance of the periodical Cicada in any locality is of great popular interest on account of the number of years the insect spends in the larva or immature form under ground. The loud noise made by the adults and their occurrence usually in large numbers, brings them to the attention of even the most casual observer. The appearance of the insect is followed by a flood of local literature on its advent, and the many

stories of all kinds concerning it and its ways find ready credence among the people. Each return is also of interest to scientists as it gives, for a brief time, an opportunity for studying the ways of this singular insect. It is only by carefully observing their number as they appear from time to time, that an approximate idea can be obtained of the rate at which the insect is diminishing in number with its successive returns. Thanks to the studies of the late Dr. Riley, we know pretty closely the distribution of the different broods of the insect in this country and are able to foretell their appearance. The advent of the Hudson river valley brood in 1894 is of special interest to us, because it is the widest in range and the most numerous of any of the six or seven broods known to occur in the State of New York.

Characteristics of the Insect.

Most people have seen a Cicada (commonly known as a locust) and many have seen both pupæ and adults of the "periodical Cicada." The wingless, red-eyed pupa will be readily recognized with the aid of figure 2 of plate IX, and needs no further description. The perfect insect may easily be distinguished from the common dog-day Cicada or harvest-fly, *Cicada tibicen*, by the eyes and the veins of the wings being a bright red. More or less of the ventral surface of the abdomen (especially in the male) and the legs are of a dull red. The dorsal surface of the body is almost entirely black. If we compare the periodical Cicada with the dog-day Cicada or harvest-fly, we will find that the latter is a considerably stouter insect with green markings on the thorax, greenish eyes, and the veins of the wings bright green, while the ventral surface is more or less covered with a white powdery substance. The male and female of the periodical Cicada with their wings expanded, and one with its wings closed as in rest, are represented in figure 1 of plate IX.

Oviposition.

The female, when ready for oviposition, selects a small branch, preferably of oak or apple, but almost any tree except the pines, and placing herself near its tip she proceeds to deposit her eggs. With her ovipositor she saws a series of oblique holes in the twig with splintered outer edges, as represented in figure 5. In each she places from ten to twenty eggs, in pairs side by side, but separated from each other by portions of woody fibre, and inserted somewhat obliquely so that their ends point upward. A fissure is made and filled with eggs in from fifteen to forty minutes, when at a slight distance on the twig the operation is repeated.

The following account of the manner of oviposition of the Cicada is based on some interesting observations communicated to me in a letter by Mr. Ira H. Lawton, Superintendent of Schools at Nyack:

After finishing one fissure the female moved slowly forward about two steps, depressed her ovipositor about 45° , and setting her saws in motion, first alternately and then simultaneously, rapidly penetrated the bark, but the ovipositor was soon elevated to 25° . After penetrating to the full length of her ovipositor and filling that chamber with eggs, she swung a little to one side and through the same hole in the bark excavated the opposite chamber and filled it with eggs. The making of each chamber occupied a little over 20 minutes or a total of 45 minutes for the whole. During the cutting of a fissure, the saws made about 80 strokes to the minute, and after making four, the female would rest for a time. The head of the Cicadas was directed, in the main, from the tree but not invariably so, as some worked with their head toward the trunk of the tree.



FIG. 5.—
Cicada
punctures
in twig.

Sometimes fifty of these fissures may be made by the same female in a twig, provided it is suitable to her needs. After depositing her complement of from 400 to 500 eggs, she drops exhausted from the branch and dies.

Natural History.

The time required for the hatching of the eggs has been variously stated at fifty-two days, forty-two days, and even so brief as fourteen days.

The newly hatched Cicadas are slender, grub-like creatures about one-sixteenth of an inch long (Fig. 6). They are as lively as ants, and after running about on the tree for a short time they drop to the ground where they bury. Their strong fore legs are admirably adapted for digging, and by their use they burrow in search of the tender, succulent rootlets into which they insert their beaks and extract their modicum of needed nourishment. The larvæ grow so slowly and require so little food, that they cause but slight injury to the trees or the shrubs to which they attach themselves. Ordinarily they remain at a moderate depth, especially during the earlier and later portions of their existence, though at times they have been found a number of feet below the surface.

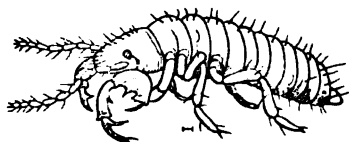


FIG. 6 Young Cicada, greatly enlarged.

Seventeen years, less the few weeks spent in the adult and egg states above ground, are passed by this insect in slow growth and development below the surface. There is but little change, except increase in size, in the appearance of the larva during this long period, but toward its close there may be noticed four scale-like appendages which represent the rudimentary wings. These have been gradually developed during the later stages of the larval existence. The emergence of the insect from its underground retreat, although separated by such a long period of years, is remarkably punctual, rarely varying more than a few days from the usual time. In the spring of the seventeenth year the larva makes its way, sometimes with great difficulty from obstacles encountered, to near the surface through a circuitous, smooth, and firmly compacted gallery, of a diameter barely sufficient to permit its passage. In its upper portion, at the proper time, it transforms to the pupa, which in turn forsakes the gallery just before it is ready to assume the perfect form and climbs the nearest tree or other support.* Here the pupa fixes itself firmly and awaits the time for the final change. The pupal shell (Pl. IX, fig. 2) soon splits along the back and the creamy-white adult with its red eyes and the black spots on the thorax works itself slowly out of the old case. It is soft just after emerging, and as it dries, the parts begin to harden and slowly to assume the colors natural to the perfect insect.

The cold weather that prevailed for the first week or two of their appearance, in 1894, resulted fatally to many, and large numbers of the dead might be seen lying upon the ground or clinging to the trees, — in the latter case often half-way out of the pupal shell. The adults live several weeks, feeding at will by means of their beak on the sap of trees. After pairing, oviposition occurs, and the long life-cycle of another brood is commenced.

A Thirteen-Year Brood.

In the Northern States of the Union this insect occupies seventeen years in completing its round of life as stated above, but in the Southern States, ranging as far north as southern Illinois, there is a form which requires but thirteen years for its transformations. It is to all appearances identical with the one occurring in the Northern States, except in a few minor details. The greater length of the growing season in the south may perhaps account for the quicker development of the larva. Dr. Riley was of the opinion that the thirteen-year form was but a race of *C. septendecim*, and not a distinct species.

* Under certain conditions the larva extends the gallery into an above-ground earthen chamber, which will be noticed hereafter.

It will here be opportune to refer to the attempt by Dr. Riley to determine by experiment, whether these two broods were really distinct species or only races. In 1885, eggs of the thirteen-year brood were sent to several places in the Northern States, and similar transfers of the eggs of the seventeen-year brood were made to the Southern States. The object of the transfer was to test the question whether the change from a warm latitude to a colder, and *vice versa*, would have any marked effect in retarding or hastening the life-period of the insect. Two lots of eggs of the thirteen-year brood were received by me in July from Dr. Riley and were placed in the apple orchard of Mr. Erastus Corning, at Kenwood, near Albany. The tree under which they were placed bears the following inscription on a zinc label:

"Thirteen-year brood of Cicada (Riley's Brood, No. VII)—eggs from Oxford, Mississippi, planted July 4, 1885."

Additional eggs, together with the larvæ that had hatched while in transit, were placed under the same tree July 21. If any of the insects have lived and remain true to their period, their appearance may be expected in May or June, 1898. Should they fail to appear at that time, search will be made for them, if need be, for two or three successive years, and the results reported to the Entomological Division of the Department of Agriculture at Washington. Eggs of this same brood were also sent by Dr. Riley, to Ithaca, N. Y.; Boston, Mass.; Kittery Point and Brunswick, Me., and Ames, Iowa.

Distribution of the Hudson River Valley Brood.

Dr. Fitch, in 1856, gives as the limits of this brood, the valley of the Hudson river, from the vicinity of Schuylerville and Fort Miller* on the north, southward along both sides of the Hudson to its mouth, where it extends northeastwardly, at least to New Haven in Connecticut, and southward across the northern part of New Jersey and into Pennsylvania. Later observations enabled Dr. Riley to extend the limits of this brood,—including the greater part of the State of New Jersey most probably; localities in Fairfax, Albemarle, Campbell, and Fulvanna counties, Virginia; Charles county, Maryland, and the District of Columbia.

Observations and reports upon the occurrence of this brood in 1894 enable us to give the following as its distribution so far as known:

In New York the brood was reported from the Rural cemetery four miles north of Albany, and thence southward in localities on both sides of the Hudson river to New York City; at New Brighton,

* Forty-seven miles north of Albany.

Staten Island, in millions, and also in abundance at Bay Ridge, Flushing, and Queens, on Long Island. The occurrence of the brood along the Hudson may be briefly indicated by the following notes: New York county, abundant in certain localities in Woodlawn cemetery; Westchester county, in great numbers north to Croton; Rockland county, abundant at Palisades-on-the-Hudson, millions at Nyack; Orange county, millions at Highland Falls, West Point, Cornwall-on-Hudson, New Windsor, Newburg, and Middletown; Dutchess county, very abundant at Beekman, Poughkeepsie, Johnsville, Bangall, Annandale, Rhinebeck, Rock City, Redhook, Pine Plains, and Barrytown; Ulster county, abundant at Wallkill, millions at Marlboro, and large numbers at Milton, some at New Paltz, a few at Saugerties, abundant at Quarryville; Columbia county, very abundant at Clermont, and Claverack, millions at Hillsdale, reported from Livingston and Stuyvesant; Greene county, many at Catskill, very abundant at Athens and New Baltimore; Rensselaer county, abundant at Bath-on-Hudson; Albany county, swarms at New Scotland, many found at Voorheesville, large numbers at Bethlehem Center, some at Kenwood, abundant near Clarksville, and in the Albany Rural cemetery at Menands.

It will be seen from the above given data that the Cicada was quite numerous in localities near the river up to Putnam county. In Orange county they were reported very numerous at Middletown, twenty miles back from the river, and also at several places nearer the Hudson, showing that this is one of the strongholds of this brood. There was no report from Putnam county and they were probably not abundant there. The northern portion of Dutchess county is another stronghold of the brood, as they were found in numbers extending back nearly fifteen miles from the river. In the southern portion of Ulster county the Cicadas were in large numbers at Wallkill, ten miles from the Hudson, and at other places nearer the stream. The insect was found in force in the southern portion of Columbia county, at Hillsdale at a point about ten miles from the Hudson. In Greene county it was not observed far from the river. It was abundant on the Forbes Manor grounds at Bath-on-Hudson in Rensselaer county, and in Albany county it occurred in a number of places, but plentifully in only a few. So far as known it was not seen north of Troy.*

In New England it was reported from localities in the vicinity of New Haven, Southington, New Britain, Farmington and Winsted, Connecticut, thus extending its range north nearly across the State to the Massachusetts line.

* It doubtless occurred north of this locality but no account of its presence was received.

In New Jersey they were observed in every county in the state, according to Dr. Smith, although it was only in the eastern portion that they were abundant. They were the most generally distributed in Bergen, Hudson, Essex, Union and Morris counties. From Pennsylvania reports of its presence were received from Tunkhannock and Blue Mountain.

Distribution of the variety *Cassinii*.

In response to the inquiry instituted by me in a circular distributed in June, 1894 (republished in my 10th Report, pp. 420-425) of the occurrence of the above-named variety, a few replies only were returned, their small number doubtless not indicating the absence of the variety, but more probably their non-recognition by the ordinary observer. None were observed at Nyack, Bangall or Hillsdale. A few were seen by Mr. Livingston at Clermont, and at Clarksville, Mr. Bagley reported about an equal number — *Cassinii* being rather the more numerous.

Time of Appearance and Continuance of the Brood.

The regularity of the time of the appearance and disappearance of this insect is remarkable when its long term of life is considered.* Both in this and in the adjoining states of Connecticut and New Jersey, it was quite true to its appointed time — the first examples of the perfect insect being seen the week following the 20th of May.† The peculiar cry of the male which has been often described, was first heard late in May in some places, and in others not until June 15th, and continued until July 1st in some localities, and in others until the 16th, from individuals which were the last to mature. None were reported as having been seen after the 20th of July. Thus the entire time during which living adults were to be found hardly exceeded two months.

Pupæ were first seen by Miss Emily Morton, of New Windsor, in the early part of March and during April as they dug their way through the soil of a green-house on the heights of Storm-Kill mountain.

The Cicada Chambers.

The interest aroused by the advent of this brood was greatly augmented by the discovery of a number of places in this State of their peculiar clay

* As an exception to this marked regularity, Dr. Riley has stated: "The Periodical Cicada frequently appears in small numbers, and more rarely in large numbers, a year before or a year after its proper period."

† The actual time of appearance is governed to a certain extent, not only by temperature, but largely by the character and condition of the soil. At New Haven it was observed that they issued earliest on the rocky heights where there were but a few inches of stony soil, and the latest to appear came from the moist ground of a fruit garden.

mounds built as an extension to the underground burrow (Pls. X, XI). Only two other instances of their occurrence prior to this have been given by writers, to be noted hereafter, and but one example was known in any collection — in that of the National museum at Washington, deposited there over twenty-five years ago.

The distribution of these above-ground chambers and the causes leading the larvæ to construct them, can not be satisfactorily explained. Their occurrence under widely different conditions, and the theories advanced to account for their building, renders it desirable that their localities be given so far as known.

Their Abundant Occurrence in New York.

To Benjamin Lander, of Nyack, N. Y., belongs the credit of having discovered and studied on South Mountain, near Nyack, by far the largest tract of ground thickly dotted with these chambers that had ever been observed. The total area was estimated by him at about sixty acres, with five to twenty-two of the structures to the square foot. Those to which his attention was first drawn, occupied a small tract of woods that had recently been burned over. Subsequent visits extended the area far beyond this tract, and included ten acres of open land which had been wooded in 1877. Other localities of the chambers, varying in their extent, were also found by him at Nyack, Upper Nyack, South Nyack, Grandview, Piermont, and on the top of the Palisades near Alpine. Several of these areas had been burned over. Mr. Lawton, superintendent of schools at Nyack, found the chambers in small numbers on a slight terrace in his yard, and although hundreds of the insects came up in other portions of the yard, no chambers were built. Quite a number were found at West Point; at New Windsor, Miss Morton observed them in the grass and in the rows between the garden plants. A few, which were about two inches long and nearly horizontal, were reported from Johnsville. They were also seen at Marlboro in the woods, and probably further search would have revealed others. In the sandy soil of the woods along the river at Poughkeepsie, the ground was thickly covered with them. At Bangall they were found under the leaves in the woods among three times as many uncapped holes: several acres were dotted with four to ten holes to the square foot. At Athens, in one locality, the soil was not much over two feet in depth where the chambers occurred, while in another locality covered with bushes, no rock could be found at a reasonable depth. Mr. Brooks of Athens had noticed the chambers in his apple orchard in great numbers when cultivating it. The clay was then

dry and would come up in quite large pieces holding the chambers, but they did not appear much above the surface. Mr. H. Van Slyke found on May 15th, the chambers very abundant at New Baltimore, distributed over a fifty-acre lot from which the brush and small growth had been burned about three weeks before. Over much of the ground, there were about eight to ten to the square foot, while in places, nearly three times as many could be counted in the same space. Frequently they crowded one another, and from three to five had been fastened together in their building. Very few of any height were built erect: most of them curved slightly just above the ground, and in many instances the cavity toward its end was nearly horizontal. They varied in height from $1\frac{1}{2}$ to $3\frac{1}{2}$ inches; in breadth from 1 to $1\frac{1}{4}$ inches; general height 2 inches; diameter inside $\frac{5}{8}$ inch, rarely $\frac{1}{2}$ inch. (Pls. X to XIII.)*

About 80 examples of these interesting structures, representing their peculiar forms and varied material, are in the State Collection, from the following localities:

North Fakens, Knox Co., Missouri; Rahway, N. J.; the following New York localities; Rural Cemetery near Albany, Bath-cn-Hudson, New Baltimore, New Scotland, Athens, Poughkeepsie and Nyack.

In New Jersey they were reported to Dr. Smith from several localities. At Port Elizabeth a recently burned tract of 100 acres was covered with the buildings. They were also found on the Orange Mountains back of Montclair, on the Palisades above Fort Lee, at Closter, Demarest, Cresskill, Englewood and New Durham. The occurrence of the above-ground chambers was not reported in Connecticut.

Construction of the Chambers.

The chambers are constructed by the pupæ with soft pellets of clay or mud brought up from below and pressed firmly into place. On examination it will be seen that they are well rounded and firmly and rather smoothly compacted within, although the marks of the claws of the pupæ are plainly to be seen. Leaves and sticks are often incorporated in the outer portions of the walls. Mr. Lander, of Nyack, has recorded that in one corner of his garden, open towers only of about one inch in height were built with no attempt at roofing them over. It would be interesting in this case to know whether or not the process was suddenly interrupted by some nocturnal prowler devouring the little builders. In this connection may be noted the

* These plates are views taken for me at this locality through the kindness of Mr. W. W. Byington, of Albany.

interesting observations of Mr. Lawton on the repairing of injured chambers. He found that in every case, except one, the pupæ repaired them soon after the injury by bringing up pellets of mud and roofing over the broken portion about half an inch from the top. The repairs were begun on one side and gradually extended over the opening horizontally, there being no attempt to form a dome-shaped roof. Some of the chambers which had been broken off at 12:15 P. M., were found with a few pellets in position at 12:45, and three hours later the opening was entirely closed over. At one time a pupa was caught with a pellet of mud in its claws.

When the time for the final transformation has come, the pupa makes its way out of the chamber through a rounded hole made by it near the top, of a size barely sufficient to admit its passage.

The Purpose of the Chambers.

Most of the habits of animals are of direct advantage to them, or else they may be explained as the persistence of some formerly useful, but which under changed conditions are no longer of value. The Cicada buildings were first found on low wet soil after heavy rains, and the natural inference was that they were constructed for the purpose of escaping excessive moisture or flooding. In 1894, they were first noticed on tracts recently burned over, or in places where the soil was comparatively shallow. The early spring had been unusually warm, and the theory was advanced that these structures were reared to protect the insects from the heat—the elevation and slope of the land in many cases rendering the earlier theory untenable. Unfortunately for this explanation, the pupæ persisted in building their above-ground chambers where the soil was far from shallow—under the leaves in woods not recently burned over, and in other places where the ground would not become unnaturally heated. It should also be remembered that the pupæ had only to descend to a moderate depth if uncomfortably warm, and that in open fields, at least, the above-ground chambers would be much warmer on a sunny day than a subterranean burrow. Moreover, their occurrence, sometimes almost covering large tracts, and again alternating with open burrows or disappearing altogether, renders a broad generalization concerning their purpose extremely unsafe.

It may be, as suggested by Mr. Lander, that the above-ground chambers are the work of those coming to the surface earlier than the proper time for their final change, as they were probably built in April or early in May, while the imago did not appear as a rule until the latter part of

May or early June. If the insect spends a week or more in the vicinity of the surface, it is manifest that a burrow capped with one of the chambers would be more secure than an open one. There are a number of causes that might hasten this upward movement; *e. g.*, the amount of water in the soil, a greater supply of food nearer the surface, a restlessness of the insect as the time for its emergence approaches—often observed in other insects, etc. The building of chambers at the surface may not be so exceptional as at first appears. There are several records of their being found in limited numbers under fallen leaves in forests, and slightly above the surface in cultivated fields—in the latter place hardly noticed until disturbed by the cultivator. It is probable that they would have been found in many other localities than those recorded, had search been made. Their being so often reported in 1894 on tracts recently burned over may be entirely owing to their ready exposure to the eye in such localities.

First Notice of the Chambers.

The earliest notice that we have of these Cicada chambers is that of observations made by Mr. S. S. Rathvon, of Lancaster, Pa., which were communicated to Prof. Riley and published by him in his *First Report on the Insects of Missouri*, accompanied by figures of a chamber received from Mr. Rathvon. Prof. Riley mentions his having previously found them in a field being plowed near St. Louis, Mo. The only other published notice of the chambers prior to the widespread interest excited by their occurrence in many places in the State of New York in 1894, appears to be one by Prof. J. S. Newberry, who in 1877 had his attention called to their discovery in a cellar in New Jersey, and nine years later published an account of them in the *School of Mines Quarterly*, vol. VII, 1886, pp. 152-154. As the communication is an interesting one and not easily accessible, it is given herewith:

Uneducated Reason in the Cicada.

In 1877, a colony of the seventeen-year locusts (*Cicada septendecim*) appeared at Rahway, N. J. During the interval between the appearance of that and the preceding generation, the town had been extended, and some houses had been erected where forests or fields existed before.

One of these houses—that belonging to Mr. Alonzo Jaques—was constructed on the site of an old orchard, and had a shallow cellar. This cellar was kept closed till about the time of the advent of the Cicadas; the door was then opened, and the bottom of the cellar was found to be thickly set with mud-cones or tubes, from six to eight inches high, an inch to an inch and a half in diameter, each of which had been

formed by the pupa of a Cicada that had emerged from the earth beneath the cellar. Finding a dark chamber, and apparently desiring to work up to daylight, the Cicadas had taken the moist clay and of this formed pellets with which the tubes were built up, apparently with the purpose of bridging over the vacancy and thus reaching the surface.

These facts appeared to me so interesting that I procured a large number of the tubes, and I had the first report verified by the written testimony of the owner of the house and several other well-known citizens of Rahway.

The document sent me with the tubes has remained in my possession to the present time. It is dated June, 1877, and reads as follows:

"These cones were erected by the pupas of the Cicada in the cellar of a house belonging to Alonzo Jaques, Rahway, during parts of May and June, 1877. They were built in an unfloored cellar of a house constructed about eight years ago in an old orchard. The cellar was dug to about the depth of a foot in red clay, and the bottom covered by a slight layer of debris, sand, sticks, etc. The cellar was perfectly dark during the construction of the cones, the only opening being shut. The locality is a dry one, the house being situated on a rise of ground, and about a quarter of a mile from the nearest water—a ditch dry in summer. These cones were not seen in the course of erection, but when the cellar was opened, about the time the locusts made their first appearance, the whole cellar bottom was covered by them. The tops of all were closed, but on breaking some of them the pupas were seen both in the hole in the ground and in the cone.

"After the cellar had been opened and left so, they appear to have stopped building and to have made holes in the tops of the cones for their exit. These cones were a great curiosity to the people of Rahway, and many came to see them, declaring them something entirely new in their experience."

(Signed)

A. E. CROW,
ALONZO JAKUES,
W. B. DEVRIE,
M. L. CROW.

In the facts cited above we have evidence of the exercise of intelligence in the Cicada, and a judicious adaptation of means to an end in circumstances that it would seem must have been without precedent in the experience of that or any preceding generation; and, therefore, for which no education of ancestors could have given a preparation. It is possible that the pupa of the Cicada is sometimes embarrassed in its ascent to the surface, by water, by too wet or too dry sand or mud, but it is hardly possible to imagine circumstances where the construction of a tunnel would be necessary.

In the earth, caves of any considerable size rarely or never occur, since surface water is constantly flowing through all superficial materials, and filling cavities with transported matter. Caves often occur in rocks, but the Cicada has no power to penetrate rock, and lives in earth near the surface.

Perhaps some of those who have made the habits of the Cicada a study, can suggest a school in which they could have received the training that fitted them for the engineering work they attempted in the case

under consideration; yet, though I have studied the habits of various colonies of the Cicada with some attention, I am quite at a loss for any explanation of the phenomena that will bring them in the scope of the theory according to which all our organs and faculties are the result of formative influences progressively developed through a long line of ancestry.

In whatever way the problem shall be solved, it has seemed to me of sufficient interest to warrant placing the facts on record.

Are the Successive Broods Dwindling in Number?

The long term of years elapsing between the appearance of a brood renders it difficult to obtain satisfactory answers to this question from more than a few localities. The following are confined to localities within the State of New York:

At New Windsor they were reported fully as abundant in 1894 as at the two preceding visitations in 1860 and 1877. They were much more abundant at Hillsdale and in greater numbers at Johnsville than at the former appearance. Mr. Frederick Clarkson reports them less abundant in Westchester county, while at New Brighton and Livingston they were much more numerous than he had ever seen them, the ground being a network of holes in many places. At Nyack they were perhaps not as plentiful as in 1877, although 80 holes to the square foot could be counted in places, and at Rock City they were equally abundant. There were about the same number in 1894 as in 1877 at Clermont, Claverack, and Marlboro, and not so many at Barrytown. They were evidently losing ground at Heath, for they were fewer in 1894 than in 1877, and then not so numerous as in 1860. One report gives not so many at Clarksville in 1894, while another states that they covered more space but were not so plentiful where they appeared as in 1877. None were reported from Tarrytown although they were said to have appeared there in 1877. Mr. Nathan Banks looked for them several times, without detecting any indication of their presence, in a piece of woods near Westbury, Long Island, where they were seen in 1877. The observations of James Angus communicated to me by letter, on their occurrence in Woodlawn Cemetery, New York, are of interest as indicating in a marked manner the effect of cultivation on this insect. No Cicadas were found by him in the improved parts of the cemetery, except under one large white oak tree, although they occurred in the unimproved portions. In preparing the land for interments it was trenched to a depth of at least six feet, except, presumably, in the vicinity of this tree, and here the insects thrived, as was evidenced by the thousands of pupal shells which could have been raked together beneath its spreading branches.

This Cicada appears, as a rule, to be found in the greatest abundance on wooded heights, as the Palisades on the Hudson and similar localities, —its numbers decreasing on the lower grounds and back from the river. At New Haven, Conn., none were seen on a damp spot of about an acre in extent in the midst of a numerous colony. At Poughkeepsie, N. Y., they were most abundant in low swampy places, and very abundant directly on the shores of the river. The insect probably can not live in soil constantly saturated with water, although it may thrive in wet soils, and this difference may possibly exist between the wet locality at New Haven and the swampy places in the vicinity of Poughkeepsie. An idea of the abundance in which it appeared in certain localities may be gained from the following notes. At Nyack they occurred "in millions; the ground in many places was honeycombed with holes, and the cast pupal cases could be gathered by the peck." They completely covered the ground in some places at Rock City, and often the holes from which the pupæ came were but half an inch apart. At Annandale six of the cases might frequently be counted on a single leaf. At New Windsor, according to Miss Morton, when the insect was most abundant its noise was bewildering, and continued day and night, only intermitting for an hour or two after sunset, and commencing again with the rising of the moon (*in litt.*). At Clermont, Columbia county, the noise was almost deafening when at its height, according to Mr. Clermont Livingston, and it was heard at night after the moon rose. The Cicada was also heard in other localities on moonlight nights.

It is natural that the number of Cicada should vary from generation to generation, as other species of the insect world are known to do, and that the territory occupied by them, in consideration of the clearing of forest lands and cultivation, should be subject to continual fluctuation. So although this brood was not found in 1894 at several places where it was seen in 1877 and occurred in diminished numbers in others, yet the positive evidence of their presence in much larger force at some, and in at least equal strength to their former advent in many other places, would seem to militate against the conclusion that this brood was dying out. That it was not recorded within forty miles of its extreme northern extension in 1843 given it by Dr. Fitch (Schuylerville), may be entirely owing to no special effort having been made for its detection along the upper Hudson.

Damages by Oviposition.

The main, if not the only serious damage inflicted by this insect is that caused by its deposit of eggs in the twigs of various trees, —the

amount of harm resulting from the puncturing of twigs for food is not known. The oviposition is largely in forest trees—in oaks, hickory and chestnut. Among cultivated trees the peach, apple and cherry suffer the greatest injury. The eggs may be found in almost all trees and shrubs, excepting those of the pine family; they are occasionally placed in cedar twigs. In 1894, the period of oviposition extended from about the first week in June to near the middle of July, but most of the eggs were probably deposited during the last ten days in June and early in July. The injury to the trees appeared to be mainly mechanical, resulting from the numerous slits in the twigs, forming almost continuous lines, pierced for the reception of the eggs. The damage to large trees, as a rule, was not serious, although some broken twigs and dead leaves gave them an unsightly appearance. Young trees were injured the most, and in some cases they were nearly ruined.

The reports received from various localities in 1894 concerning the injury wrought by this insect varied widely in character. In a number of places little or no damage was reported. At New Windsor, where it occurred in great abundance, Miss Morton reported that many limbs of small trees were killed, and in a few instances very little was left of the tree. Mr. H. D. Lewis is authority for the statement that at Annandale, thousands of thrifty young trees were virtually ruined by this insect. That this would naturally be the result of excessive oviposition, will appear from the following:

At Hillsdale, N. Y., in a twig nine inches long and one-fourth of an inch in diameter at its larger end, seventy slits were counted,—each slit containing about twenty-four eggs, or 1680 for the entire number. The Cicadas injured young hickories so greatly at Highland Falls as to render them unfit for hoop poles. In some localities the woods were said to appear as if fire had run through them. As a general rule, however, the damage by this insect was not great. Young trees undoubtedly suffered greatly in localities where the insect abounded, and the larger ones were severely pruned, but in most of the latter, the injury was more in appearance than in reality,—the pruning not proving very injurious, although at the time the dead leaves gave an impression of permanent harm.

Serious Results Reported From Cicada Stings.

Stories of the injurious and deadly character of the sting by this insect were widely circulated and firmly believed by many. A boy at West Point, George Pavsek, was reported to have been bitten June 19th on the hands and face and to have died in a few hours,—medical aid proving

of no avail. Subsequent investigation and a letter from the father of the lad, proved the story to be utterly false.

A school-girl, whose name was given, was reported to have been stung in the back of the neck by a Cicada that flew into the school-room: she was taken home in a carriage and died in great agony the following morning. This story had even less foundation than the preceding, as it could not be traced to any reliable source, and the name of the person was not known in the locality where it was said to have occurred.

Mr. H. D. Lewis, of Annandale, N. Y., was reported to have been stung so severely as to necessitate the amputation of a finger. His reply to the inquiry made of the truthfulness of the report, was as follows: "Allow me to say that the report of my being stung and the amputation necessary was pure invention, as I still retain the allotted number of bodily members unimpaired."

The story of a swarm of locusts attacking and killing a horse near Jacksonville, Pa., at the foot of South Mountain, is also another newspaper report deserving of no credence.

During the last advent of the Cicada in the Hudson river valley, hundreds and possibly thousands of persons handled the insects. Many school children amused themselves by playing with them. After investigating the newspaper and other reports of fatalities and injuries inflicted by their sting, and mailing nearly one thousand circulars throughout the region visited by the Cicada, in which special inquiry was made in relation to persons stung by it, only one instance of the kind was reported, and even in this there was reason for doubting that the slight wound had been inflicted by a Cicada. From the above, in connection with other investigations, there is good reason to believe that the insect is incapable of inflicting a dangerous or severe sting, and that the fatalities ascribed to it in the past are pure and simple inventions.

Natural Enemies.

A Cicada year is a time of unusual feasting for many vertebrates in the locality where it occurs. Cats and dogs eat the pupæ as they emerge from the ground. Skunks, ground-hogs and grey squirrels have been observed feeding on them, and it is probable that several other quadrupeds avail themselves of this abundant food-supply so easily obtained. Domestic fowls of all kinds eat them greedily,—in some places they were known to remain in the woods the entire day feeding on them. They are eaten by most of the insectivorous birds. Robins are said to prefer them to strawberries, and the crow devours them in preference to corn.

The English sparrow was observed to feed on them continuously in some places, while in others the occurrence was rather rare. Dr. J. B. Smith has recently stated: "This bird seems to have an intense hatred for the insects, attacking and pulling them to pieces in the most wanton manner. Near the large cities where the sparrows are numerous, entire broods have already been destroyed." Other birds that may be named as feeding on the Cicada are: the cuckoo, king-bird, oriole, sparrows, cat-birds, thrushes and ground-bird. Even the common land turtle was tempted to include the pupæ in its brief bill-of-fare.

The only insect enemies that were seen to attack the Cicadas were species of ants. They probably did not often molest the living, but contented themselves with preying on the dead or dying.

The fungus, *Massospora cicadina*, was found destroying the insect in widely different localities. At New Windsor, N. Y., many old males were found infested. The same conditon was reported at Nyack and at Clermont; at the latter, it was thought that possibly a few females were similarly affected. The infestation was also observed at Bay Chester and Clarksville, N. Y.; it was reported from New Jersey, in many instances at Morristown, and in a few at New Brunswick. The fungus was not found at New Haven, Conn. Failure to learn of it in other localities, by no means implies its absence, but merely that it was not seen.

Preventives of Injury.

It is practically impossible to prevent the Cicada from ovipositing in the twigs of trees, unless they are small and their value would warrant the expense of enclosing them with fine netting or light cloth so as to exclude the insect during the egg-laying period.

Since the greatest injury is done to young trees, much loss could be avoided by refraining from setting out new stock for the two or three years preceding the time for the appearance of a brood. This would be of special importance in the vicinity of forests, or on land which had borne a growth of trees at the previous advent of the insect that had suffered from its attack. In such localities it would be well not to prune older trees the spring before the appearance of the Cicada, unless the pruning be made so severe, as to leave no slender tips to serve as an invitation for the insect's oviposition.

Pemphigus rhois (Fitch).*The Sumac-Gall Aphis.*

(Ord. HEMIPTERA: Subord. HOMOPTERA: Fam. APHIDIDÆ.)

- FITCH: in Month. Journ. N. Y. St. Agricul. Soc. for Aug., 1866, p. 73 (described, as *Byrsocrypta rhois* with remarks).
 WALSH: in Proc. Entomolog. Soc. Phil., vi, 1866, p. 281 (referred to *Melaphis*).
 PACKARD: Guide Study Ins., 1869, p. 524, fig. 523 (brief mention).
 WALSH-RILEY: in Amer. Entomol., i, 1869, p. 108, fig. 89 (brief mention, in Illinois and New York).
 THOMAS: 8th Rept. Ins. Ill., 1879, pp. 152-153, fig. 28 (brief mention).
 LINTNER: 3rd Rept. Ins. N. Y., 1887, p. 142 (from Schenectady); in Country Gent., lix, 1894, p. 686 (brief account); 10th Rept. Ins. N. Y., 1895, p. 503 (abstract of preceding, all as *Melaphis*).
 OESTLUND: Bull. 4 Geolog. and Nat. Hist. Surv. Minn., 1887, p. 23 (bibliography, description, remarks).
 SMITH: Cat. Ins. N. J., 1890, p. 451 (listed).
 RILEY-HOWARD: in Insect Life, v, 1892, p. 145 (tannin in gall).

This insect is rarely seen, except by those curious enough to cut open one of the galls that it forms on the leaves of sumac. If the examination be made in September, it will be found tightly packed with particles of white flocculent matter which are the cast skins (exuviae) of the lice at their successive moltings, hundreds of yellow-green wingless aphides, with wing-pads upon their sides (the pupal stage of the insect), and a smaller number of matured winged forms. A little later all will have become winged.

This insect was referred to the genus *Byrsocrypta* by its describer, Dr. Fitch, in 1866. Shortly thereafter Mr. Walsh made it the type for the new genus *Melaphis*, but upon insufficient grounds, according to Mr. Oestlund, who has recently placed it in the genus *Pemphigus*.

Description of the Gall and Immature Aphides

The galls have been described by Dr. Fitch as follows:

Resembling little round balls of different sizes, the largest measuring an inch in diameter, their surface uneven and slightly knobby in places, and covered with fine erect white hairs; their color pale buff-yellow or greenish-yellow, and on the side exposed to the sun bright crimson-red. Attached to the leaf by a narrow neck, opposite which, on the upper side of the leaf, is a thickened wart-like elevation, or sometimes higher conical protuberance, which is also covered with erect white hairs; and the leaf itself is partly withered, and turned red or yellow. Cavity inside large; in the smaller galls filled with small, oval, pale dull yellow lice of different sizes, their eyes black, their feet and antennæ white, the larger ones measuring 0.03 in length, and some of these larger ones thinly

covered with a very fine pruinose powder, resembling mold; some having small scales or rudimentary wings, showing them to be pupæ; their cast skins thickly interspersed among them, resembling white meal; the larger galls with only the walls of the cavity covered, and crowded with similar lice.

Exception should be taken to Dr. Fitch's comparison of the galls to "little round balls of different sizes." All that have come under my observation are elongated, and decidedly pyriform in shape, as may be seen in figure 1 of Plate XIV, which fairly represents quite a number of others in the state collection. It is probable, however, that examples of rounded forms may at times occur, if we may judge from the peculiarly shaped one (almost semi-globular) represented by Walsh-Riley in the figure given by them, and reproduced by Dr. Thomas in the 8th Missouri Report, and also by Dr. Packard in his "Guide to the Study of Insects."

Description of the Imago.

Winged female, 0.06 in length, and to the end of wings 0.10; pale dull green or yellowish-green; head and antennæ black; base of thorax blackish, and its anterior part light yellow; legs pale; wings hyaline, but not clear and glass-like, their veins black, the third one abortive nearly half its length, the stigma salt-white; abdomen commonly thinly covered on the back with fine pruinose matter, its middle rather deeper green; antennæ shorter than the thorax, thread-like, four-jointed, the first joint slightly the shortest, and the second joint rather the longest. (Fitch.)

Mr. Walsh has taken exception to the above description, in the following criticism:

Dr. Fitch's description of the winged female of this species applies only to immature specimens extracted from the gall. After they have been out some time, the legs and the whole body, except the collar which becomes very pale brown, turns to a decided black; and the stigma then is not "salt-white," but pale dusky with a whitish reflection.

Life-History and Food-Plants.

The life-history of the species, so far as known, may be briefly summarized as follows: The growth of the gall commences in the spring, when it may be found occupied by the wingless mother louse in company with her progeny in their larval stage. The occupants multiply rapidly, increasing largely in number until during September, when the gall matures and gives forth the colony, all becoming winged eventually.

The same gall occurs on the *Rhus glabra* and the *Rhus typhina*. In a note published in *Insect Life* (*loc. cit.*) it is stated that the galls of this insect on *Rhus glabra* contain nearly as much tannin as the ordinary

Cynipid gall from China and Japan, viz. from 60 to 70 per cent, or about three times as much as is found in the foliage. Thus it would appear that the irritation of the tissues by the insects causes a concentration of the tannin in the affected parts.

Distribution.

The galls of this insect are apparently not of common occurrence, or possibly it should be said, they are not frequently observed, since they are rarely if ever found on sumacs standing where they are exposed to the sun.

They have been recorded from New Jersey, and from several localities in New York, Illinois, and Minnesota. The species probably has a much wider, though local, distribution. According to Dr. Fitch, it was rare in New York, for in describing it in the year 1866 he states that he had not met with it during the nine preceding years, although he had diligently searched for fresh specimens, and was compelled to fall back on those gathered in 1857 for its description. Examples in the state collection from which the figure was taken were received on September 7, 1886, from Schenectady, N. Y., and others from Clinton, N. Y., were received in September 1894. They have not come under my observation in the field.

Gossyparia ulmi (Geoff.).

The Elm-Tree Bark-louse.

(Ord. HEMIPTERA: Subord. HOMOPTERA: Fam. COCCIDÆ.)

GEOFFREY: *Histoire Abrégée des Insectes*, i, 1762, pp. 512-513 (described, as *Coccus ulmi*).

HOWARD: in *Insect Life*, ii, 1889, pp. 34-41, figs. 1-5 (general account).

JACK, J. G.: in *Garden and Forest*, ii, 1889, p. 461, fig. 129 (at Boston, Mass., life-history, remedies); in *id.*, iv, 1891, p. 184 (distribution, injuries, remedies).

LINTNER: 6th Rept. Ins. N. Y., 1890, p. 189 (at Marlboro and Albany, N. Y.); 10th *do.*, 1895, p. 519 (abundant at Ghent, N. Y.); in *Country Gent.*, ix, 1895, p. 425 (on willow at Loudonville), p. 585 (identified); in *Bull. 6 New Ser., Divis. Entomol., U. S. Dept. Agricul.*, 1896, pp. 60-61 (distribution in the state); 11th Rept. Ins. N. Y., 1896, p. 280 (abstract of C.-G. notice), p. 287 (from Loudonville, Albany, and Catskill, N. Y.).

PERKINS: *Insects Inj. Amer. Elm.*, from 11th Rept. Vt. St. Bd. Agricul., 1890, pp. 81-87, figs. 61-64 (general account).

- RILEY-HOWARD: in *Insect Life*, ii, 1890, p. 351 (? *Colastes* a parasite of); in id., v, 1892, p. 51 (occurring at Brighton, Mass.).
- CRAW: in *Bien. Rept. Cal. St. Bd. Horticul.* for 1893-94, 1894, pp. 90-92, 2 figs. (in California, description and remedies).
- COCKERELL: in *Entomolog. News*, vi, 1895, p. 325 (at *Agricul. Coll.*, Mich.); in *Canad. Entomol.*, xxvi, 1895, p. 31 (listed); in *Bull. Ill. St. Lab. Nat. Hist.*, iv, Art. xi, 1896, p. 324 (listed, synonymy).
- HILLMAN: *Bull. 28 Nev. St. Univer. Agricul. Expt. Stat.*, 1895, pp. 3-8, figs. 1-3 (account of in Nevada).
- LOUNSBURY: *Bull. 28 Hatch. Expt. Stat. Mass. Agricul. Coll.*, 1895, pp. 23-26, figs. 13, 14 (brief account of in Mass.).
- KIRKLAND: in *Bull. 2, Ser. of 1897, Mass. Crop Rept.* for June, 1897, pp. 35-37, fig. 5 (distribution in Mass., remedies).

The sad condition of the shade-trees in many of our larger cities, is exciting considerable attention and especially is this true where the elm-leaf beetle, *Galerucella luteola*, has become familiar through its defoliation of numerous elms, the recent destruction of many fine trees in the Hudson river valley, and the doomed condition of thousands of others. As if the long list of insect pests preying upon the foliage or burrowing within the bark and sap-wood of the elms was not sufficiently extended, another species has recently come over from abroad and is rapidly extending its range, and fast making itself a public nuisance from its blackening the foliage and branches and also the side walks beneath with its vile excreta.

Introduced from Abroad.

The elm-tree bark-louse, *Gossyparia ulmi* (Geoff.), like a large number of our most common and injurious insects, is an introduced species. The precise manner and time of introduction into this country are not known and probably will never be definitely ascertained. It was first brought to the notice of the U. S. Department of Agriculture in 1884 through Mr. Charles Fremd, of Rye, Westchester Co., N. Y., who at that time complained of the elms in his nursery being troubled with thousands of a red-looking mealy bug. The insect (represented in figure 2 of plate XIV) had probably been brought over on some nursery stock several years prior to its discovery at Rye. This importation is another illustration of the ease with which insects can be introduced from other countries on nursery stock.

History of the Insect.

This bark-louse was not determined at the time it was received by the U. S. Department of Agriculture from Mr. Fremd, nor in other send-

ings of the same by Mr. J. G. Jack, from Cambridge, in 1887 and 1888. In the autumn of 1888, it was discovered in several localities in the City of Washington. The following year a more complete series of its stages having been obtained from Mr. Jack, it was identified at the Department with the European *Gossyparia ulmi*. In July of the previous year (1888) it had been received by me from Marlboro and Albany, N. Y., and observed by Professor Perkins at Burlington, Vermont. It was also detected about this date in New York City by Mr. Henry Edwards, and in 1890 it was sent to Washington from Brighton, Mass. Some young trees at Palo Alto, California, were seriously affected by this insect in 1893. The next year it occurred abundantly at Ghent, N. Y. In 1895, Prof. G. C. Davis found it numerous on the elms of the Michigan Agricultural College, and badly infested trees were reported by Prof. F. H. Hillman at Carson City, Nevada. About this time it made its appearance at Amherst and Brookline, Mass. The present year it was received by me from Catskill, and observation has shown it to be quite largely distributed in the vicinity of Albany and Troy in this state.

Its Distribution.

It will be seen from the above that this insect is now known to occur in six States in the Union besides the District of Columbia. In Massachusetts it appears to be extensively distributed over the state, as published in a recent notice of the insect by Mr. Kirkland. It is quite probable that it has already been introduced in the adjoining states of Rhode Island and Connecticut. From the occurrence of the pest at Burlington, Vt., there is little doubt but that it will soon invade New Hampshire and Maine, if it has not already done so. It is known to occur in several localities along the Hudson river valley from the City of New York to Troy. In the upper portion of this district, the insect has been found so abundant and generally distributed that the same condition will probably soon be reported for the lower Hudson.

The other recorded occurrences of this insect indicate a wide distribution for it in the future,—ranging from the Atlantic to the Pacific and, at least, from about the latitude of Washington, D. C., to near the Canadian border.

Injuries by this Pest.

It is impossible to estimate even approximately the damage caused by this insect in its eastern distribution, associated as it largely is with the destructive elm-leaf beetle.

Both at Boston, Mass., and at Carson City, Nev., its operations have been very injurious to the vitality of the infested elms. The trees in Albany and Troy have suffered severely from the combined attacks of the elm-leaf beetle and this scale insect. The many trees that have recently died, were probably killed mainly by the beetle, but many are now suffering severely from the work of *Gossyparia*. In the early part of June the secretion of honey-dew from the insects on a badly infested tree was so abundant as to keep the walk beneath constantly wet and in almost a slimy condition. One could stand under the trees and see and feel the continual shower of the tiny drops. The injurious nature of the work of the insect was more plainly evident in September, when its presence could be detected at a glance from some distance, by the blackened foliage and limbs of the infested trees—the copious secretion of the coccids on the leaf and branch having furnished the proper medium for the growth of the blackening fungus, *Coniothecium saccharinum* Peck. Thus the elm-leaf beetle and *Gossyparia* working on the same trees, transformed many from beautiful ornaments to hideous monuments of insect devastation. In this City and in Troy, *Gossyparia* seems to prefer the English and Scotch elms, although it occurs in limited numbers on the American elm. In both of these cities this pest is so generally distributed that it will largely aid the elm-leaf beetle in the destruction of our European elms, unless earnest effort be speedily made for the preservation of our favorite shade trees.

Description of the Insect.

It is only the adult females that, as a rule, attract the attention of the casual observer. They may be seen clustered along the under side of the smaller limbs and resembling, in a general way, a growth of lichens. The full-grown viviparous females just before giving birth to their young, are about 0.1 inch long, oval in outline, and with ends slightly pointed. They are surrounded with a mass of a white woolly secretion which also partially indicates the segmentation along their margin (Pl. XIV, figs. 2, 5). At this period the females are full of eggs which give a reddish stain when crushed.

The young are easily recognized on the infested limbs and leaves as dark-eyed yellow specks, being less than 0.5 mm. or $\frac{1}{8}$ of an inch in length. They are of an elongated oval form, rounded anteriorly and tapering posteriorly to a pair of pointed processes, each bearing a long and a short seta. Each segment of the body is indicated by a lateral spine; there is a row of six around the anterior border of the head, and a

double row down the middle of the back. The growing young become darker and finally assume a yellowish-red color. Each segment becomes covered with spiny processes secreting wax. The general form of the young larva is retained (Pl. XIV, fig. 4). The antenna of the female before impregnation, is composed, like that of the young, of six segments, the second and third being the longest and the fourth and fifth shortest. The antenna of the immature male has six nearly equal segments and a longer seventh.

The oval cottony-like cocoon of the male is represented in figure 3, of Plate XIV. The presence of the insect within may be known by its two long protruding anal filaments.

The male will rarely be seen by most observers. It is a delicate two-winged creature of a reddish color, with rather large antennæ for so small an insect. It moves slowly over the limbs with a clumsy air. It is not easily disturbed and rarely takes to flight. An interesting feature is the occurrence of two forms. The earlier to appear,—the pseudimago,—is characterized chiefly by wing-pads in the place of normally developed wings. A few days later the perfect males with fully expanded wings come forth. Although the pseudimago is incapable of flight, it can probably perpetuate its kind, as it has been observed in coition.

Life-History.

This insect is the most conspicuous in the months of April, May and June, as the females are then about full-grown and are preparing to give birth to their young. Their active yellow progeny make their appearance in the latitude of Albany early in July. They move rapidly over the bark for a time and then settle along the veins of the leaves, principally the midvein, and in large numbers on the greener tips of the twigs. A few may be found in the crevices among the old females. They remain in these positions until into September or later, when many desert the leaves and establish themselves on the bark of the twigs for the winter, although it appears that numbers do not take this precaution in time, but fall with the leaves and are scattered by the winds. Many of the latter must perish, although a few may live to establish colonies in new localities. The winter is past in the immature form, the insects being about two-thirds grown, and protected by a whitish excretion from the numerous processes covering the dorsal surface. At the first warm weather in the spring, the wintered individuals show signs of activity. Early in April the females molt for the last time and the males form their cocoons. At this time many travel some distance before selecting a suit-

able place on which to settle. This is especially true of the males, as their snow-white cocoons are more rarely found in the center of a mass of the females than at the ends of dry twigs and other places unsuitable for the opposite sex. An abundant secretion of honey-dew occurs from the time the insects resume their activity in the spring until near the time that the young appear. The males remain in the pupa state for a few days only. A few pseudimagos emerge first (about six days after pupation), which are followed a week later by the perfect males. These soon perish after pairing,—the young not appearing until over two months later as indicated above. Soon after pairing, there is a marked difference in the features of the female. Her form changes from elliptical to oval, the secretion of the wax is more copious and is mainly from the lateral spines instead of from both lateral and dorsal as during the early autumn.

Means of Distribution.

The comparatively recent introduction of this pest and the establishment of its colonies in distant states, show very clearly how great a factor the shipment of nursery stock may be in the distribution of injurious insects. The rapid spread of this insect in eastern cities where it has obtained a foothold is surprising, and must be largely attributed to other means. It was not discovered in Albany until 1889. In the short space of seven or eight years it has spread to a large number of trees in all parts of this city and of Troy, where it is so generally distributed that perhaps three-fourths or even a greater portion of the elms are infested to some extent by it. It is by no means easy to explain how this spread was effected unless through the agency of birds. That notorious public pest, the English sparrow, has undoubtedly been an important agent in its distribution. It is but the work of a moment for the active young to crawl upon the foot of a bird touching the limb, and leave it at any later time. Many infested trees are so isolated, that there must be some such means for the conveyance of the wingless forms from one tree to another. It is possible that some of the immature insects falling with the leaves in the autumn may survive the winter and found colonies in new localities to which the leaves are carried by the winds; but this means of distribution would at best be quite limited and uncertain, and by no means could account for the spread of the wingless female throughout so many states in less than a score of years.

Natural Enemies.

No natural enemies of this coccid have been observed preying upon it in this country, so far as known to me. Professor Perkins mentions the occurrence of a number of hibernating lady-birds, on infested trees, the most numerous species being *Adalia bipunctata*, and suggests that they might possibly feed upon it. The lady-birds were very common in Albany in the summer of 1897, and were noticed in large numbers on trees infested with various species of plant-lice, but none were observed actually attacking, or in the immediate vicinity of, the *Gossyparia*. Many flies and other insects were seen about infested trees, but they were evidently attracted by the honey-dew, and could not therefore reasonably be considered enemies of this insect.

Remedies.

Perhaps the best remedy for this pest is spraying with kerosene emulsion or a whale-oil soap solution. The insecticide should be applied either in the early spring just after the hibernated forms have molted or soon after the young make their appearance. Late in the autumn the insects are so well protected that a solution of four times the normal strength would be needed for killing them. It might be preferable to treat the trees at this time, as the insects may then be directly reached in the absence of leaves, although a stronger solution would be necessary than earlier in the year. Small trees have been effectually cleaned by going over them with a stiff brush. The brush would be made more effective by dipping it in either kerosene emulsion or a whale-oil soap solution from time to time. It may possibly be found that a heavy stream of cold water thrown directly on the insects would reduce them to harmless numbers, if repeated several times during the season. Where convenient, this, from its simplicity, might be preferable to other methods.

Neuronia pardalis Walker.

(Ord. NEUROPTERA : FAM. PHRYGANIDÆ.)

- WALKER: Cat. Sp. Neurop. Ins. Br. Mus., Pt. 1, 1852, p. 7 (description).
HAGEN: Neurop. N. Amer., 1861, p. 250 (description from Walker); in Proc. Bost. Soc. N. H., xv, 1873, p. 293 (from N. H.); in Beitr. kennt. Phrygan., 1873, p. 394 (description and remarks); in Psyche, i, 1875, p. 96 (rarity).
HARRIS: Entomolog. Corr., 1869, p. 333 (description).
BANKS: in Trans. Amer. Entomolog. Soc., xix, 1892, p. 362 (listed).

An example of this insect, was taken in Keene Valley, N. Y., in June, 1896, which, so far as known, is its first capture in the State of New York. Mr. Howard Notman, its fortunate collector, has kindly sent a colored figure of the insect, from which the accompanying illustration has been taken. It is apparently a rare species. Dr. Harris has recorded two examples of it captured near the Great Monadnock mountain in New Hampshire. Dr.



FIG. 7. — *NEURONIA PARDALIS*. (After Notman.)

Hagen has given "Nova Scotia (Redman)" as its habitat in his enumeration and description of the eight North American recorded species. Mr. Banks has added Canada and Labrador to its localities.

At a meeting of the Cambridge Entomological Club in October, 1874, Dr. Hagen mentioned among the rare captures for the year, an example of this species, of which he remarked: "The only nearly related species live in Japan, the northern part of Europe, and in Liberia. They have the peculiarity to fly very high; this specimen was taken on top of a stage coach."

The following is Dr. Harris' description of the insect:

Body dark brown, antennæ, with the upper part of the head and thorax, black, the latter having two abbreviated fulvous lines; upper wings brown, with numerous large, rounded, tawny spots in rows between the nervures; hind wings brown, with a broad, tawny, transverse band near the tip, and attaining the margin at the anal angle; base spotted with tawny yellow upon and behind the anterior edge; head beneath, with the palpi, coxæ, anterior thighs and tibiæ and bases of the intermediate and posterior thighs, fulvous.

Leptodesmus sp. ?*Thousand-legged Worm Infesting Green-houses.*

(Class MYRIAPODA : Ord. CHILOGNATHA : Fam. POLYDESMIDÆ.)

A gentleman in charge of some private greenhouses in Kansas City made complaint of "a pestiferous, repulsive pest" which is proving very injurious, and which it has not been possible to control. Accompanying the specimens sent he has written :

We have used ammonia—one tablespoonful to four quarts of water, soapsuds, and slacked lime. We have taken off the pots from the benches in this particular house and covered them with powdered lime—then put on two inches of cinders and replaced the pots, and still the worms come, lying under each pot on top of the cinders. The benches were also cleaned and flooded with boiling water, and even steamed with a hose attachment. Can you tell me what the species is and how to eradicate it? One of the greenhouses contains three beds of earth that was mixed with sheep manure from stock yards here, by a florist employed. They are everywhere in this house, and nearly everything planted in beds is dead or dying; but begonias, geraniums, colias, heliotrope, etc., in pots, are doing well in spite of the pests sticking to the bottom of the pots."

The greenhouse pest of the above communication proves to be, upon examination of the specimens sent, one of the numerous species of "thousand-legged worms" that occur in the United States. Those that usually come under observation have rounded, cylindrical bodies, as seen in the family Julidæ. Those received, are flattened and spreading out at the sides, where the numerous short legs with which they are furnished have somewhat the appearance of a fringe (Pl. XV, fig. 1).

Description of the Millepeda.

Most of them are about three-quarters of an inch long, of a reddish-brown color, and are apparently full-grown, while others are about one-half inch in length and whitish. The head bears six-jointed antennæ sparsely clothed with coarse setæ (Pl. XV, fig. 3), and the body of the male 30 pairs of legs,—a pair on the first, second, fourth, and seventh, and two pairs on the fifth, sixth, and eighth to the eighteenth segments inclusive; the last two segments legless (apodal); the female has 31 pairs of legs, there being two pairs on the seventh segment; the hinder angles of the segments are acute. Repugnatorial pores surrounded by slight swellings occur on segments 5, 7, 9, 10, 12, 13, 15–19 inclusive. The smooth convex dorsal plates with only a slight transverse sulcus are characters of the genus *Leptodesmus*, to which this form is referred. At the bottom of the transverse sulcus there is a minute tuberculate ridge.

The lateral carinæ are yellowish, feebly sulcate with two minute serrations, the anterior one bearing a small seta (Pl. XV, fig. 4). The rhomboidal gnathochilarium is represented in fig. 7 of plate XV. The copulatory legs of the male are abruptly flexed and terminate in four slender, curved processes (Pl. XV, fig. 6), which are nearly colorless, and vary slightly in form in different individuals.

In the event of this being a form new to science, it may be known as *Leptodesmus falcatus*, in allusion to the hook-like shape of the first process of the copulatory legs. This species was also found swarming in soil containing house plants in Albany, N. Y., the following season.

The Allied Genus *Polydesmus*.

It is evidently closely allied to the genus *Polydesmus*, of which a common form in Europe is *Polydesmus complanatus*, or "the flattened millipede" (fig. 8) — represented by Curtis and other writers as being one of the most destructive of its kind, feeding upon the roots of wheat, onions, pansies, and several garden products.

Dr. Fitch, in his 10th Report on the Insects of New York, has given a detailed account of the habits of one



FIG. 8.—*POLYDESMUS COMPLANATUS*, slightly enlarged. (From Brehms Tierleben.)

of the "flattened centipedes" which he regarded as identical with the European *complanatus*. It seems, however, to be different, for that species has not been recognized as yet in our country. It is thought that the form that Dr. Fitch wrote of (without any accompanying description) may have been the *Polydesmus Canadensis* Newport,—figured and briefly described by Dr. Packard in his *Guide to the Study of Insects*, page 677, and referred by Bollman to *Polydesmus serratus* Say. He represents it as "crawling everywhere over the damp surface of the ground by night, in search of the nicest, daintiest food it could discover and withdrawing into the crevices under chips, stones, and similar situations during the daytime." The underside of cucumbers lying on the damp ground were often almost covered with them and the skin much eaten. The roots of onions when lifted were found eaten entirely off by them—completely arresting the growth of the bulb. From finding many of the worms in the stalks of cabbage distorted with warty swellings and cracks, Dr. Fitch was led to believe that they were the cause of the disease known as "anbury" or "club-foot" in cabbage.

Study of American Myriapoda Desired.

The Myriapoda, a class embracing the centipedes and millipedes, have not been given much study in this country, and therefore comparatively little is known of them, either scientifically or in their economic relations. Many of the millipedes feed only on decaying vegetable matter and are, therefore, of minor economic importance. Of those recognized as injurious to vegetation from attacking living plants, we are still without knowledge of such approved methods of dealing with them as will ensure protection from their varied forms of attack—especially when so severe and general as above reported in the Kansas City greenhouses. To meet such an emergency, we can only give a few remedies that have been recommended, and suggest some methods which give promise of being aidful if not entirely efficient.

Remedies.

Lime has been represented as a remedy by several writers, yet it has not apparently been of particular service in the present infestation. John Curtis, the eminent author of "Farm Insects," states that soot spread over the surface of the ground will drive the plant-feeding millipedes away, and also recommends spreading old cabbage leaves as a bait for attracting them, when they may be killed with hot water.

As they are mainly nocturnal feeders, many can be killed by lifting the pots and sprinkling diluted or pure kerosene on the worms gathered beneath, or wherever they may be seen on the benches or elsewhere. The kerosene may be diluted by shaking it briskly in a pot, or better still by making it into a strong emulsion. Pyrethrum and powdered hellebore might each be experimented with as a contact insecticide, either in its powdered state or mixed with water.

Probably the best results would be obtained by the use of traps or baits. Small pieces of board laid on a damp surface would be attractive as hiding places. Dr. Fitch states: "On raising up a chip or fragment of board that happens to be lying anywhere in the garden, you will probably find lurking under it a dozen or it may be fifty of these worms."

The traps would be much more efficient if made more attractive by placing beneath them slices of potatoes, turnips, or carrots. In England, slices of mangolds have proved to be one of the best baits that could be employed. If the baits were poisoned by dipping them into a Paris green mixture, it would not be necessary to visit them so often for the collection of the worms.

I think it probable that the infestation of the greenhouses has come from the piles of manure brought into them, as millipeds are known frequently to abound in manure, and are believed to breed in it. If on examination they prove to be present in large numbers in the manure, some efficient measure that may suggest itself should be taken for destroying them in it, and the manure should be removed to some distance from the houses.

The following thorough measures proved, as might be expected, an effectual means of ridding the greenhouses of the pests. (See *Garden and Forest*, v, 1897, p. 348):

In the spring we removed all plants from the greenhouses, also all wooden benches, and everything but the bare brick walls and the glass roofs. The floors had been concreted. We burned sulphur in liberal quantities three times a week for several weeks. Then we dusted all interiors thoroughly with hellebore, and in the fall, just before replacing plants in the houses, we coated all interiors with whitewash. Since then we have not found a single one of these unpleasant pests.

Kansas City.

J. G. C.

The above-mentioned treatment should exterminate almost any pest to be found in a greenhouse. Such a fumigation might well be given greenhouses that are empty or nearly so during the summer as a preventive to the undue abundance of any injurious animal or plant form the coming season. Then if a little care be exercised when the house is filled in the autumn, not to introduce any pests, very little trouble should be experienced in keeping the plants in a healthy growing condition.

APPENDIX

21

(A)

NOTES ON SOME OF THE INSECTS OF THE YEAR IN THE STATE OF NEW YORK.*

The year has been characterized by the absence of attacks of the usual severity of a considerable number of our common insect pests—particularly those that infest our fruit trees. I do not recall a year before the present one in which reports have not been received by me of abundance of the apple-tree aphid, *Aphis mali* Linn., and of injuries feared from it. The eye-spotted bud-moth, *Tmetocera ocellana* (Schiff.), which has become so destructive to orchards in the western counties of the State, has hardly been heard from. No abundant presence of the apple-leaf Bucculatrix, *Bucculatrix pomifoliella* Clemens, has been reported to me, nor of the apple case-bearer, *Coleophora Fletcherella* Fern. The apple-tree tent-caterpillar, *Clisiocampa Americana* Harris, has been less injurious than in preceding years. The hop-vine aphid, *Phorodon humuli* (Schränk), made its appearance late in the season—in August, in portions of Madison and Oneida counties, and the blackening of the leaves from deposit of honey-dew excited some alarm, but it is not believed that serious harm has been done.

So far as my observation has extended—confirmed also by the observation of several collectors and others,—with a few notable exceptions, the year has also been remarkable for a scarcity of insect life. Some short excursions made in the vicinity of Albany specially for collecting, were without any satisfactory results. My Adirondack collections were unusually limited. Apparently not one-fourth of the usual number of insects were abroad (exceptions to this were the common house-fly and grasshoppers). Mosquitoes, the gray-gnat (*Ceratopogon*) and the black-flies (*Simulium*), were among the rarities, even in the month of July. The scarcity of butterflies was particularly noticeable, and was remarked upon by others than entomologists. Not a single *Papilio Turnus* was seen nor any of the other *Papilios*, except one *Asterias*. No Graptas were taken,

* Read at the Eighth Annual Meeting of the Association of Economic Entomologists at Buffalo, N. Y., August 22d, 1896, and published in Bulletin 6 New Series, U. S. Department of Agriculture, Division of Entomology, 1896. A few additions have since been made to the paper.

when in former years hundreds could have been captured. The Argynnis were very few and mainly *Atlantis*. *Feniseca Tarquinius*, for which Keene valley is a noted locality, was not seen. *Colias Philodice* was comparatively rare, while *Pieris rapæ* was abundant in the fields and about the blossoms of the burdock. The presence and capture of several examples of *Pieris oleracea* was welcomed as evidence that our once familiar native species had not been entirely driven away by the hosts of the foreign invader. In part compensation for the absence of so many of our diurnals, the beautiful "red admiral," *Pyrameis Atalanta*, was uncommonly abundant in the last week of July and in early August.

The night-flying species—the moths—were also very few, and it was only possible to secure a few of the attractive *Plusias* that abound at these high elevations; but among them were several examples of the resplendent *Plusia balluca* Geyer.

In each of the other orders was there an equally poor representation of the species commonly met with—quite noticeable in the families of the Cicindelids, Coccinellids, Cerambycids, in the *Bombylidae* and *Syrphidae*, in the dragon flies, and many others.

What particular climatic conditions had resulted in so marked a reduction in the usual abundance of insect life is beyond our knowledge. It would be interesting to know if any other class of the animal kingdom was similarly affected, and if it also extended to the flora.

The following are brief notices of some of the insect attacks that have come under observation:

TENTHREDO RUFOPECTUS (Norton).

An example of this saw-fly was received May 25, from Mr. Thomas Tupper, of Corning, N. Y. It operates in the stems, after the manner of, and often in association with, the current-stem girdler, *Janus integer* (Norton). It had been common in his garden for many years past, but by cutting off and destroying each wilted tip last year as soon as seen, he had nearly checked its operations.

The insect appears to have an extended distribution. Norton gives it from New England, New York, Pennsylvania, and Illinois. Cresson, later, gives United States and Canada. It has been taken in a number of examples in Canada—at Ottawa and vicinity, between June 5th and July 1st. In my collections made at Schoharie, N. Y., it occurred as late as July 18th.

DATANA INTEGERRIMA Gr.-Rob.

The walnut trees in Bellport, L. I., have been almost entirely stripped of their leaves by the caterpillar of this species, according to reports received from Dr. H. G. Dyar, of New York city.

This is one of the most common of our *Datanas*, and its larvæ are often found assembled in large companies on the hickory. They also feed on walnut (*Juglans*), beech (*Fagus*), oak, and occasionally on willows and apple.

THE ARMY-WORM.

The notable entomological event of the year has been the occurrence and the ravages of the army-worm, *Leucania unipuncta*, over the greater part of the State—from its eastern to its western borders, and from its southern to nearly its northern boundary. It has been authentically reported from 55 of the 60 counties of the State. Its extension and the injuries committed by it are believed to be greater than had ever before been recorded in the State. When it appeared on Long Island and in Westchester county in 1880, although serious harm was done to the crops invaded, it was limited to the southeastern portion of the State, although spreading over some of the New England States, New Jersey and Pennsylvania.

Its habits have been similar to the many recorded occurrences elsewhere, unless that in many instances its operations were first observed in rye fields. From these it spread to oats, to timothy, and corn. Clover has been reported as eaten by it, and peas to a limited extent. Grass, of course, was consumed in its travels.

Of its abundance it may suffice to state: In many places they occurred in millions. Roadways crossed by them were “blackened” by their numbers. They “covered fences” and it has been said that they covered sides of buildings. The noise made by their feeding could be heard after nightfall. The clothing of a person standing for a short time in an infested field needed frequent brushing and picking over to remove them. The sight of their marching armies was said to be “nauseating.”

Of the many preventives employed to prevent their ravages—as heretofore, plowing furrows with a perpendicular side toward the field to be protected from invasion, was the most effective and the one more generally resorted to. Attempts to save fields of barley, oats and timothy when once infested, were of little avail.

The earliest notice of the insect within our State, came to me on July 1st, when it were found on corn near Albany. This was followed on the 2d inst., by examples sent from Cambridge, Washington county; and for the week thereafter, reports followed closely and thickly of army-worm ravages in several of the eastern counties, and later, from southern and western parts of the State.

Larvæ received and collected by me were full-grown, and entered the ground for pupation as early as July 4th. Two changed to pupæ on the 9th on the surface of the ground in the box with the earth given them. On the 23d the moths commenced to emerge, and on the same date some of its parasites, *Winthemia 4-pustulata*, also made their appearance. Only a few parasites were disclosed. Their eggs had not been observed on any of the larvæ that I had examined, while in the western part of the State they have been reported as not at all uncommon.

THE WHEAT-HEAD ARMY-WORM.

The wheat-head army-worm, *Leucania albilinea*, has been reported from the town of Morley, in St. Lawrence county. I was informed under date of July 22d, that the caterpillar, identified from examples sent me, was doing much damage in barley fields. Its operations were shown, 1st, in the awns of the barley having to a great extent fallen, or more probably, been cut off: 2nd, a great number of the heads were cut off between the head and the next joint below. In one instance where the crop had been a most promising one, it was estimated by the owner, that two-thirds of it had been destroyed. The injury had not been sudden or rapid as in the work of *L. unipuncta*, but had been under observation for some considerable time. The barley-heads lying on the ground were subsequently eaten out, leaving only the husks or chaff remaining: this, it was thought, was done by the caterpillars.

A feature noticed in the work of this insect, was, that the leaves of the barley were not eaten—the first to be consumed by the army-worm, but that with the exception of the severed head, the plant was left in all its freshness and healthy appearance.

EUFITCHIA RIBEARIA (Fitch).

This insect, generally known as the "gooseberry span-worm," from the preference shown by the caterpillars for that plant, was reported in very great numbers, during the latter part of May in a garden in Pine

Plains, Dutchess county, N. Y., where it stripped the leaves of both gooseberries and currants and threatened the destruction of the bushes. It had been noticed for a few preceding years, and had been steadily increasing. This season it was beyond control either by hand-picking or jarring, and was proving a more serious pest than the currant-worm, as hellebore powder had little if any effect upon it.

Although this insect is represented as common by most of our writers, and according to Dr. Packard, "is everywhere abundant in the Northern States, flying in gardens and resting on the leaves of currant and other plants," it can not be numbered among the more destructive garden pests of the State of New York. The above is the first instance in which the attention of the State Entomologist has been called to the injuries of the caterpillar. Nor can it be common on our wild currants or gooseberries, for, to my surprise, in referring to the State Collection, the moth is represented in a single example taken in Keene Valley on July 21st, 1895.

Apparently the insect abounds in a locality for a few years and then diminishes or entirely disappears. It was more numerous, according to Dr. Fitch in 1847 when it was described and named by him than in any of the intervening years to 1857 when he again wrote of it. During this latter year, it proved very injurious to gooseberries and currants at Paris Hill, Oneida County, N. Y., during the third year of its presence.

THE CANKER WORM.

The spring canker worm, *Anisopteryx vernata* (Peck), which is quite local in the state and seldom very injurious, has this season been committing serious depredations in scattered localities. The present year, Mr. E. J. Preston has sent under date of May 21st, examples of the caterpillar of various sizes, with some of nearly full growth. He represents them as skeletonizing the foliage in several of the orchards in his immediate neighborhood. Efforts had been made to stay their ravages through Paris green spraying. When used in several orchards by a person employed who was familiar with spraying methods, a mixture of one pound of the green and four pounds of lime to 200 gallons of water, did not seem to kill a worm. The same in 150 gallons of water was also ineffectual. A third spraying with 100 gallons of water was next tried, the result of which had not been reported.

It would seem from the above, provided that the Paris green was of the standard purity, that the canker worm is almost as resistant to the effects of Paris green as is the larva of the gypsy moth.

Mr. Preston refers to the observed habit of the caterpillar, which has been frequently noticed elsewhere, of dropping from the leaves when they have been nearly all consumed, and hanging by a thread until carried by the wind to some neighboring tree, or else dropping to the ground.

To the orchardists of Amenia the canker worm is popularly known as the "fire worm," from the appearance of the leaves after all their green has been eaten away, as if they had been swept over by fire.

The canker worm has also been reported from Moreton Farm, Monroe county, and from orchards in Wayne county, as quite common, and from several localities in Western New York. The seasonal conditions have apparently been favorable for its multiplication.

CACÆCIA ROSACEANA (Harris).

Cacæcia rosaceana (Harris), known as "the oblique-banded leaf-roller," which feeds on an unusually large number of food-plants, has been quite abundant and destructive in apple orchards. It has been sent to me from several localities in Eastern and Central New York, as having been very injurious not only to the foliage and the blossoms but later in the season to the young fruit into which it ate rounded holes averaging one-third of an inch on the outside and larger within, and often extending to beyond their center. They attacked the fruit as soon as it had set, and continued until it had attained nearly an inch in diameter. The injury had been quite serious in the orchard of Mr. Morris Tompkins, of Germantown, Columbia county. The moths were known to him from having reared them from the caterpillars, and on June 13th, such numbers were drawn to light at night that apprehension was felt of the work of a second brood. Walsh and Riley have recorded as a habit of the caterpillar its gnawing off the rind of green apples, but I do not recall mention of its destroying the fruit by eating large holes into the interior.

Another caterpillar of larger size—of about an inch in length of a pale green color and marked with white lines and dots—is also chargeable with eating into the fruit, after the manner of the *Cacæcia*. I failed to rear the examples that were sent me, but it is not improbable that it may be *Nolophana malana* (Fitch). It appears that *C. rosaceana* may be in part, controlled by jarring. State Botanist Peck brought on the 18th of May, several of the larvæ which he had taken from his plum trees in jarring for the plum curculio. From one small tree, twenty larvæ fell upon the sheet underneath.

A CECIDOMYID IN CHOKE-CHERRIES.

The galls of a Cecidomyid larva on choke-cherry, *Prunus Virginianus*, were brought by State Botanist Peck, from Bethlehem, N. Y., on May 28th. The larvæ emerged and entered the ground, but none of the flies have made their appearance.

In Keene Valley, in former years, I have found this cherry very abundantly galled by apparently the same insect, in the month of July. Many larvæ were disclosed from them, but in the several attempts made to obtain the imago, all have met with failure.

The present year not a single galled cherry could be found in the localities in Keene Valley where in other years they had abounded.

These galls have been studied by Prof. Geo. F. Atkinson, of Cornell University, in connection with a fungus attack which he found to be usually associated with them—named and described by him as *Exoascus cecidomophilus* (see Bull. 73, C. U. Agricultural Experiment Station, September, 1894). It was not ascertained by him if the larvæ attack the fruit before or after the attack of the fungus. It was thought that the larvæ attack and deform fruits which are not affected by the fungus. In this he was probably correct, as I have no recollection of the fungus presence on the galls collected by me in Keene Valley.

This Cecidomyid has not as yet been described, although it has been observed by several entomologists.

EUPHORIA INDA (Linn.).

The larvæ of *Euphoria Inda* (Linn.), formerly known as the Indian Cetonian, were found in large numbers beneath chip manure at Menands, N. Y., in the latter part of June. From their general appearance and from their occurrence in manure, they were believed to be the "muck-worm," *Ligyris relictus* (Say). Examples were brought to me within the manure inclosed in a box. Not long thereafter, they were found to have eaten all of the decayed portion, leaving only the bits and pieces of chips and a large quantity of rounded pellets of their excrementa. These, together with additional ones obtained, were transferred, on July 30th, to a larger box with an ample supply of food. The box was, opened from time to time, until the 8th of August, when two *Euphoria Inda* were resting on the surface. Examination of the contents, gave the following: Two perfect beetles within their cells, one of which was on the point of emerging. Another cell gave a beetle, uncolored, having just transformed from the pupa. The remaining cells (5) contained pupæ.

The species not being recognized in its larval stage, no examples were retained for the State Collection, nor description made of it, but several of the pupæ were preserved in alcohol. I have not found any description of the early stages of this insect, nor of its larval habits. Of the latter Dr. Thomas has written: "the larvæ, probably, like those of other known species (of Cetonians), live in rotten wood, as the perfect insects are often seen flying over chip yards, probably in search of a convenient nidus for their eggs" (4th Illinois Report, page 91). From the above, taken in consideration with the occurrence of the larva at Menands, it may be inferred that chip manure is its favorite habitat.

Do the larvæ feed also on growing vegetation? State Botanist Peck from whom the larvæ were obtained, had applied some of the manure to a few hills of corn in his garden. The following day one of the hills was noticed to have been cut down, as if by cut-worms. Upon digging around the stalks, two larvæ of the *Euphoria* were discovered, but no cut-worms, from which it would seem probable that the grubs had committed the injury.

THE ELAPHIDION OAK PRUNER.

The oak pruner, *Elaphidion villosum* (Fabr.) is not, I believe, of frequent occurrence on apple trees, but during the first week of June, its operations were very noticeable in an orchard in Voorheesville, Albany county, where a large number of twigs and branches had been thrown to the ground by it. Some of the branches brought to me were from three-tenths to seven-tenths of an inch in diameter. Each contained the mature and active larva, within a closed cell in its burrow, prepared for pupation.

The maple-tree pruner, *E. parallelum* Newm. (regarded by many as identical with the preceding species) was very abundant in early June in the maples bordering the avenues in the grounds of Governor Morton, at Ellerslie, in Dutchess county. Not a maple was seen which had not a score or two of the recently fallen pruned branches lying beneath it, although previous gatherings had been made and destroyed.

THE ASPARAGUS BEETLE.

The asparagus beetle, *Crioceris asparagi* (Linn.), is continuing its spread in the central and western counties of the State. In my Ninth Report, reference is made of its appearance at Geneva, Ontario county in

the year 1884, and at Rochester, Monroe county in 1892. On June 2d of the present year (1896), Mr. A. P. Case of Vernon, Oneida county, sent to me asparagus twigs bearing numerous eggs of the beetle, and shoots eaten by the larvæ. He writes:—"The insect has appeared since Saturday last (May 30th) on all of the asparagus beds here, where they have never before been seen. Every sprout is covered with the worms, and the new seedling shoots are alive with the full-grown worms, and newly hatched ones are burrowing into the stalks. The tops of the young shoots are alive with the mature worms which eat them off as they appear. The crop is worthless for this year." During the meeting of the Association of Economic Entomologists, at Buffalo, a further western extension of the insect within our State was brought to my notice, in examples given me by Mr. Ottomar Reinecke of that city which were collected by him August 20th from wild asparagus growing in the outskirts of the city.

[On June 2d, 1897, information was received of its abundant presence in a garden at Geneseo, Livingston Co., where it was attacking the young shoots as they appeared above ground, and destroying the crop.]

THE ASH-GREY BLISTER BEETLE.

The ash-grey blister beetle, *Macrobasis unicolor* (Kirby) was received (June 9th) from New York city, where it was reported as feeding destructively on a locust hedge. The young and tender leaves at the end of the branches had been eaten over the entire extent of the hedge of about 600 feet in length. They were driven away or killed when the pyrethrum powder recommended for them, was applied.

Examples of the same insect came June 25th from Factoryville, N. Y., where they were rapidly destroying the leafage of potato vines.

THE CHINCH BUG.

A correspondent from Almond, Allegany Co., writes that this insect *Blissus leucopterus* Say, is very thick on his new seeding and has ruined his pastures, and that it has destroyed his meadows for the past 4 or 5 years. They were working in the greater part of his 300 or 400 acres of land. Mr. Van Duzee, in his collections in Erie and Niagara counties the present year, has met with only a few scattered individuals of the species.

THE SAN JOSÉ SCALE.

The San José Scale, *Aspidiotus perniciosus* Coms., has apparently found the climatic conditions unsuited to its establishment in all except the extreme south-eastern part of our state. Its existence in a few localities has been reported to me, but in each instance another scale has been mistaken for it. At the Kinderhook locality where it was first discovered in the Hudson river valley, it has been nearly exterminated. Recently its presence was suspected by the owner of the orchard, Mr. Morrell, where it had been found abundantly two years ago, but on examination, the scale proved to be the rather closely resembling one, *Aspidiotus juglans-regie* Comstock. An examination of the orchard showed no living San José Scale, but later, a single living specimen alone on a twig, was brought to my office by Mr. Morrell.

A neighboring orchard in Kinderhook was reported as badly infested with the scale. On examination in July, by Mr. E. P. Felt, my assistant, the scale was found in abundance on plum trees of apparently ten or twelve years' growth, but upon perhaps twenty trees that were carefully examined, not a single living scale was found. The trees had not been treated for the scale, and it is therefore probable that the insect had been winter-killed. How long they had been upon the trees, or the source of the infestation, was not learned, but the age of the trees would indicate that the pest had not been introduced on nursery stock. The orchard was within one fourth of a mile of that of Mr. Morrell, and it is highly probable that it had been carried from there upon birds or insects.

The scale has also been reported to me recently (in August), from another locality in New York, in the valley of the Wallkill river—a tributary of the Hudson river. A few fruit-trees in an orchard in Middletown, Orange county, are stated to be infested with the scale—the trees having been received from a New Jersey nursery. Inquiry was promptly made of the owner of the orchard of the extent of the infestation with proffer of assistance if needed, but no reply having been received, it is probable that the infested trees were promptly destroyed, and that the spread of the insect was not feared.

THE OAK KERMES.

The peculiar oak-kermes, *Kermes galliformis* Riley (Pl. V, fig. 1), which bears so marked a resemblance to a gall as to be mistaken for it by everyone not acquainted with it, may not be rare when one knows where to look for it, but it has always been a rarity in my own experience. One of my cor-

respondents, Mr. W. R. Walton, of Middletown, N. Y., has been fortunate in his collection of it and has kindly contributed a number of examples to the State Collection. He also has been successful in breeding from it the beautiful Lepidopterous parasite, *Euclemensia Bassettella* (Clemens), with which it is so frequently infested and of which he has made excellent colored drawings in its several stages (Pl. V, figs. 2-7). From Kermes taken from scrub oak in the latter part of December, he obtained the moth toward the last of the following June. The larger number of the mature Kermes were found to be infested by the parasite.

THE ELM-TREE BARK-LOUSE.

Gossyparia ulmi (Geoffrey), an European Coccus, feeding on most of the varieties of the European and American elms, was first noticed in this country at Rye, Westchester county, N. Y., in June of 1884. (See Howard in *Insect Life*, ii, 1889, pp. 34-41). Examples of it were brought to me from Marlboro, Ulster county, in July of 1888. Since that time, it appears to have become distributed in different portions of the State, and to have planted itself in several localities in the vicinity of Albany. In May and again in June, it was brought to me from Loudonville, Albany county, and in June of the same year, from two places in the city of Albany, and also from Catskill, Greene county, 40 miles to the southward.

In June of the present year, Mr. J. B. Washburn, brought a limb of elm from his grounds at Delmar, Albany county, bearing dense patches of the Coccid. It was blackened to a degree that indicated the abundant presence of the insect the preceding year. The tree — a young one — of about three inches diameter of trunk, was infested both upon the trunk and the limbs. Other elms upon his grounds were not infested. The scales were apparently about full-grown, but no young had yet been given out.

A large number of trees in the city of Albany, are at the present time (in August), showing severe and injurious attack from this insect. The leaves are blackened by their secretions, and some of the branches whitened by their abundant presence. Their larvæ, about half-grown, are to be seen in large numbers in the crotches of the smaller twigs, on the lower surface of the leaves, and in the crevices of the bark. The infested trees are mainly the Scotch elm, *Ulmus montana*.

The insect is also quite generally distributed in Troy — six miles to the north of Albany, where in combination with the attack of the elm-

leaf beetle on *Ulmus montana*, it is threatening destruction to many of the trees. It also occurs at Menands and Watervliet, between Albany and Troy. The infested trees can be recognized at a distance by the blackened appearance of the limbs and foliage.

PHYTOPTUS? PRUNI (Amerl.).

Leaves of a Chickasaw plum, received the middle of May from a correspondent in Muncy, Pa., had numerous mite galls scattered over their surface, on both their sides. On the lower surface they are of an elongate purse-like form, and give out from their sides some short white hairs resembling mould: on the upper surface they are rounded and completely covered with longer white threads. Within the galls, a powerful microscope showed a minute transparent four-legged mite—the architect—apparently in an early stage of growth. The mite, if we may judge from the characters of the gall that it produces, is identical with an European species, known as *Phytoptus pruni* Amerl., and which has not, we believe, been previously detected in this country.

(B)

ENTOMOLOGICAL ADDRESSES.

THE MOSQUITO.

[Read before the Dana Natural History Society of Albany, May 14, 1887.]

Strange as it may seem, the common objects in nature surrounding us on every side and ever at hand, are those of which we frequently know the least. Day after day throughout our lives many, if not most of us, pass along the streets without knowing the nature of the stones we tread upon, the names of the trees that throw their grateful shadows over our pathway, or of the birds or insects that fly around us. If the cultivated mind may find "sermons in stones, books in the running brooks," surely volumes of intense and absorbing interest are to be found in the interpretation of the vegetable and animal kingdoms, in their infinitely varied forms, their complicated structure, their wonderful transformations and peculiar habits: and how much do we lose from our inattention to these common objects—the almost constant presence of which before our eyes is a perpetual invitation to their observation and study, and a rebuke for their neglect.

I have chosen for my topic of this afternoon paper, one of these common objects—a very common insect, with which, perhaps, you may think yourselves sufficiently familiar, while, in reality, knowing next to nothing of it. And if I shall succeed in showing you that the mosquito, perhaps the most universally obnoxious of our insect pests, possesses many attractive features and has its beneficent uses in nature, you may feel inclined to extend to it henceforth some degree of toleration, and even to honor it with a little attention. Yet I shall not expect that even the enthusiastic members of the Dana Natural History Society will be wrought up to such a state of ecstasy in its contemplation that they will adopt the sentiment of a distinguished naturalist of the past century—"it is impossible to behold and not admire the amazing structure of the mosquito's sting: one undergoes with pleasure a puncture that enables us to observe how this wondrous piece of mechanism works."

The Common Name.

Mosquito is a Spanish and Portuguese word, and is probably the diminutive of the Spanish *mosca* fly. Its orthography varies, it being given by Webster as m-o-s-q-u-i-t-o, m-u-s-q-u-i-t-o, m-u-s-k-e-t-o. For

the last phonetic mode of spelling, I have a decided preference, and would gladly see it adopted were it not that the orthography approved by Webster of m-o-s-q-u-i-t-o, is sanctioned and sustained in its employment as the specific name of one of the species of the genus *Culex*, and scientists do not feel at liberty to change a single letter in a specific name once given and accepted, except under a few prescribed conditions. Another mode of spelling with which we sometimes meet, is m-o-s-c-h-e-t-o, the authority for which I do not know.

The common name, as is often the case with unscientific names, does not define the insect intended. The insects which in the United States are known as mosquitoes, are popularly known in England and also written of, as gnats. By some writers, the blackfly — the terror of the Adirondack tourist in early summer, has been claimed as a mosquito, while in reality it belongs to a family — the *Simuliæ* — quite removed from the *Culicidæ*. The Portuguese, in Brazil, are said to apply the name to a small species of *Simulium* or black-fly.

Its Place in Classification.

The mosquitoes and associated gnats belong to the order of Diptera, or two-winged flies, and to the family of *Culicidæ*, so named from its principal genus, *Culex*. This family from the high degree of development of its mouth parts, has been placed near the head of the Diptera, as are the *Cicindelidæ* or tiger beetles at the head of the *Coleoptera*. The principal characteristic of the family, is its long and slender beak or proboscis, nearly half as long as the insect, appearing as a simple organ, but really composed of several pieces, peculiarly fitted for their function of forcing their way into the flesh and drawing blood therefrom.

The mosquito, is not, as its popular name would seem to imply, a single species. There are a number of distinct and well characterized species, which have their special haunts, different degrees of annoyance, and different seasons of the year devoted to their forays. Even in that season when the entire insect world out of doors is generally supposed to be indulging in its sleep of months preparatory to its spring opening and summer campaign, we are not left wholly without representation of this intrusive family, for the winter months may bring us occasional visits — fortunately they are rare — from *Culex hyemalis*, the winter mosquito.

All of those which are grouped in the family of *Culicidæ*, may properly be regarded as mosquitoes, as they are closely allied in structure and in habits.

Number of Species.

Although exceedingly numerous in individuals, occurring at times in localities in swarms so immense that they have been mistaken for clouds or smoke, the *Culicidæ* are not very numerous in species. In a catalogue by Mr. Walker, formerly of the British Museum, published in 1874, one hundred and fifty-eight species from all parts of the world are given. Of these, the North American species comprise about one-fourth of the number, for in the last published catalogue, that of Baron Osten Sacken, in 1878, forty-two species are recorded as belonging to North America, arranged in the five genera of *Megarrhina*, *Culex*, *Anopheles*, *Aedes* and *Corethra*.^{*} The specific names that designate many of these have a merit that does not always attach to our scientific nomenclature—that of being appropriate and characteristic. For example, we find the following names in the list of species of *Culex*, each one of which we may presume, has been bestowed after experimental test of its fitness, as they lead us up the gamut by harmonious gradations from the initiative *Culex punctor*, to *pungens*, and on to *stimulans*, *perturbans*, *provocans*, *impatiens*, *implacabilis*, *excitans*, *excrucians*, and culminating in *Culex damnosus*! The last is applied to the notable “gallinipper” of the southern swamps, which is said, but I do not vouch for the truth, to be capable of boring with its proboscis through a leather boot.

It is not probable that in the numbers above given, we have an approximation to the real number of species. The family, for some reason, has been but little studied. When I applied a short time ago to the gentleman who is the best authority that we have among us on the Diptera, for the names of a few of our more common species represented in my collection, he was unable to determine them for me. Another of our distinguished entomologists who enjoys a brilliant European reputation from his long residence in Europe could not decide the question which I propounded to him—does *Culex pipiens* of Europe, the type of the genus, occur in North America, to which it has been credited.

Distribution.

Every known part of the globe has its peculiar species of the mosquito. They are endowed with power to resist any degree of cold and to endure extreme heat. They particularly swarm in the tropics where they often

^{*} Dr. L. O. Howard, in a paper published the present year (1896), has recorded twenty species of mosquitoes belonging to the United States, which had been examined by D. W. Coquillett, of the Division of Entomology at Washington, accompanied with a list of ten additional species, which had not been examined for verification. (See *Bull. 4, New Series, U. S. Dept. of Agricul., Division of Entomology.*)

render life a burden. In the frozen regions of the north where winter reigns, their numbers have been compared to a snow-storm when the flakes fall thickest, or to the dust of the earth. There are localities which they are entitled to claim as their own, for explorers have been driven back in agony from the attempt to penetrate them. To other localities they have given name, as to Mosquito, a township in Illinois; Mosquito, a village in Newfoundland; Mosquito Creek in Indiana, another of the same name in Iowa, and still another in Ohio; and the Mosquito Country of Central America. In certain districts of Louisiana and other of the Southern States, their abundance diminishes by one-half the value of the plantations. Those who have traveled in summer on the lower Mississippi or in the Northwest, have experienced the torment which these frail flies can inflict: at times they drive everyone from the boat, and trains can sometimes be only run with comfort on the Northern Pacific railroad by keeping a smudge in the baggage car and the doors of all the coaches open to the fumes. "The bravest man on the fleetest horse dares not to cross some of the more rank and dark prairies of Minnesota in June" (Riley). The marsh lands of New Jersey and portions of Long Island, you will remember are particularly noted for their abundance, and the frequenter of the Adirondacks knows of their powers of annoyance, as they compel him if particularly sensitive to their sting, to seek relief in flight.

It would seem that our English cousins have much less to endure from this tormenting pest than we, for Professor Westwood has written: "The mosquito is far more annoying in its attacks upon the inhabitants of America than our European species is to us; it is there requisite to have their beds inclosed in a curtain of fine gauze to defend the sleeper from their attacks." The Rev. Mr. Kirby, in his delightfully fascinating work entitled "Introduction to Entomology," after a graphic recital of the torments endured in various parts of the world from the mosquito's poisonous sting, and the inferential conclusion that it were "a lesser terror that the forest should resound with the roar of the lion or the tiger than with the hum of the gnat," closes with this pæon of gratitude: "With what grateful hearts ought the privileged inhabitants of these happy islands to acknowledge and glorify the goodness of that kind Providence which has distinguished us from the less favored nations of the globe, by what may be deemed an immunity from this tormenting pest!" Evidently the fogs of England and London smoke are not agreeable to the mosquito.

Means of Protection.

In that portion of the world which we occupy, and in the localities where this insect occurs in annoying numbers, comparative immunity from its attack is attainable by the use of mosquito nettings, but there are countries where these luxuries are not procurable, nor would their employment afford the desired protection. The inhabitants of some of the districts of Brazil, at certain seasons, can only obtain sleep at night by burying their bodies several inches beneath the sand, and covering their heads with a thick cloth. On the west coast of Africa the natives swing their hammocks from elevated posts with fires burning beneath them to repel the insects with the smoke and heat. In Guiana the poorer classes find a degree of protection in covering their bodies with paint and varnish. Russian soldiers in the neighborhood of the Crimea resorted to sleeping in sacks as a protection, but this served only as a palliative of the unendurable torments to which they were subjected by the attacks of the insatiable blood-suckers of that region. In Lapland, a writer states, that it is impossible to eat or sleep or keep a light burning in the hut without constant fumigation, and the additional resort to a coating of the exposed portion of the person with rein-deer cream, rancid fish-oil and tar.

For the benefit of those whose summer wanderings may lead them into the haunts of the mosquito, under circumstances when heavy gloves and veils and nets may not be conveniently worn, I would state, that when the annoyance becomes too serious to be longer borne, protection may be procured by making oneself disagreeable to the mosquito through means not quite so pronounced, as that to which the Laplander resorts, but by applying to the hands and face a small quantity of oil of tar combined with a little carbolic acid. This is, perhaps, the best application that can be used, as a preventive of mosquito attack under conditions above named.

Severity of the Bite.

The effects of the bite vary greatly in different persons. There are those who are scarcely affected by it, and indeed are rarely bitten, either by this insect, the bed-bug or the flea, although in situations exposing them to attack and with their companions suffering from the infliction. I have no explanation to offer for the attractiveness of some persons for these pests and the reverse in others, but it would seem that it might result from some peculiar emanation from the person, as no attempt is made to draw the blood or pierce the skin of those exempt from attack.

While in some, only a slight and brief irritation follows the bite, in others, the well-known itching sensation becomes intense, and is accompanied with serious inflammation and swelling which may be continued for several days. Again, the resultant effect of the bite often depends upon the general condition of the system at the time, and upon the particular portion of the person where it is received. I do not know of any fatal result attending the bite of a single mosquito, but we have a well-authenticated instance where death ensued as the consequence of the sting of a hornet inflicted in the scalp of a bald head.

When the occasional mosquito, which we find a trial, is multiplied a thousand-fold, the wounds against which the victim is powerless to defend himself, become a most serious matter. The swollen hands almost lose their service; the bloated face scarce admits of recognition. Mortification of the limbs has ensued, rendering amputation necessary, and cases are recorded where death has resulted. Professor Jaeger relates that on one occasion when traveling on the banks of a river in Russia, his servant was driven to such a degree of madness by his sufferings from the dense cloud of mosquitoes in which they were enveloped, that he was only prevented from shooting himself as an escape from his misery, through the united strength of two athletic Cossacks.

The severe stinging sensation and subsequent inflammation and itching of the bite, is owing to a poisonous fluid injected into the wound through the proboscis at the time of its insertion to affect the blood and cause it to flow more readily. This opinion, advanced by Reaumur long ago, was for a long time held as probable. Very recently, however, it has been verified, by Dr. Macloskie, of Princeton College, New Jersey, in the discovery of two poison-glands, the duct through which it is conveyed into the hypopharynx and the escape of the fluid, in oily globules from an aperture near the tip of that organ which is subapical like that in the rattlesnake's fang, so as not to weaken or impair the delicacy of its point.

Of the effects of this poison, and the reason for believing in its existence before it had been demonstrated, Dr. Dimmock, has written as follows: "After having experimented a large number of times with the living mosquito, I am convinced that there is use made of a poisonous saliva; for, when biting, if the mosquito fails to strike blood, which it often does on parts of the back of my hand, although it may have inserted its proboscis, nearly full length, in from one to six directions in the same and withdrawn it, yet, in such cases, if no blood be drawn, no more effect is produced upon my skin than is produced by the prick of a sharp needle — a red point appears only to disappear in a few hours. Certainly there

has been as much tearing of tissues in such a case as the above mentioned, as there is, when *Culex* settles on a place rich in blood, and, with a single probing, draws its fill. The amount of poisonous effect upon me, as proved by numerous experiments, is in direct proportion to the length of time the *Culex* has occupied in actually drawing blood. The above-mentioned facts would indicate a constant outpouring of some sort of poisonous fluid during the blood-sucking process."

Palliatives of the Bite.

Various applications have been recommended and are employed to alleviate the effects of the bite, such as vinegar, lavender water, salt and water, spirits of camphor, ammonia, etc. Pressing the puncture and forcing out some of the blood, and with it the injected poison, has also been prescribed, but beyond doubt the best method that may be adopted is the following: When the bite is first felt, resist the natural impulse to crush the creature and stoically endure the trifling pain, while you add to the stock of your entomological knowledge by critically observing the extreme delicacy and the entire *modus operandi* of the performance, particularly noting the disposition made of the sheath while the contained case of instruments are being buried in the flesh. A brief period of forbearance will suffice to fill the abdomen of the skillful phlebotomist to its utmost capacity—the gradual enlargement and the deep purpling of which through its thin and distended walls you may watch. The fill obtained, the lancets will be leisurely withdrawn and repacked in their case, and with the prolonged draught taken through them most of the injected poison will have been withdrawn. If you are not able at this juncture to say with Sterne's Uncle Toby, "go, poor insect, the world is wide enough for you and me," then, if your study has failed to repay you, revenge yourself in her death as she assays with her stolen burden to fly slowly away. If you terminate her existence while the lancets are buried in your flesh, their barbed ends together with most of the poison will remain in the wound to irritate and exact of you the penalty of a wasted opportunity and an unscientific proceeding. You might, at least, if you feel that you have no contribution to make to Madame, intimate to her by a gentle touch of the finger, that it would be quite as agreeable to you if she would present that little bill somewhere else. A million lessened by one, would aid but slightly in the extermination of the species in your immediate vicinity.

The Female only, Bites.

I would not be thought as reflecting in the slightest — even through innuendo — upon the gentler sex — “Heaven’s best gift to man” — without whose presence Eden was incomplete; but a proper treatment of my topic and inexorable science demands of me the statement to which the use of the feminine pronoun has been leading me up and preparing the way, to wit: all the annoyances, pains, tortures, which the world endures from the mosquito, is solely chargeable upon Madame Culex. I cheerfully admit that the natural taste of Mr. Culex may be equally blood thirsty, but alas, poor creature! he has been left without the means of gratifying a sanguinary desire. He is, therefore, compelled to forego the exquisite relish of the royal repasts in which his consort finds so great delight, and be content with the juices of plants and the nectar of lilies, and of other flowers to which he is particularly addicted. He has not been favored by nature with that delicate and complicated piece of apparatus which is so admirably adapted, as has been graphically expressed, to being driven “through crushed and bleeding capillaries, shrinking nerves and lacerated tissues.” With a becoming humility, therefore, he rarely visits us in our apartments, or even obtrudes his presence upon us when we seek his haunts; and few of us know of the branching plumes, fit for a knight, that adorn his front and make him far more beautiful than his unpretentious mate.

The Biting Organs.

By this time you may desire to be told something of the character of the biting organs of which the effects have been related to you.

Let me preface by stating that the mouth-parts of insects consist, normally, of six pieces, viz., four lateral pieces consisting of a pair of upper jaws denominated *mandibles*, a pair of lower jaws named *maxillæ* (which in biting insects that feed on solid matter move horizontally), an upper lip known as the *labrum* and the lower lip, the *labium* — these two covering the mouth from above and beneath. Some of these bear appendages which need not at the present be referred to. These organs, of course, are greatly modified in the different orders of insects, to adapt them to the different methods of taking their food — whether fitted for gnawing or tearing in pieces solid substances, as in the beetles — transformed into a sucker with expanded disc for sipping its food as in the house-fly — extended into a long, flexible tube coiled up in a spiral when at rest, for drinking the nectar from the bottom of tubular flowers, as in the butterflies, or forming a long, firm, jointed proboscis for thrusting into plants or

animals through which to draw their juices, as in the Hemiptera or bugs. These parts exist in all insects, although at times some of them may be but rudimental. The mouth-parts of the female *Culex* represent all of these typical parts of different insects, and in the formation of its proboscis, two other organs unite (as in most of the Diptera) which are the pharyngeal sucking organs, named the *epipharynx* and the *hypopharynx*.

It therefore appears that the proboscis of the mosquito, which in its normal condition seems but a single piece, upon dissection or close examination is found to consist of seven distinct pieces—eight pieces in reality, but two so combine as to form one. Some authors have stated the number of pieces at four, five, or six, but there certainly are as many as seven in *Culex pipiens*, *C. ciliatus* and *C. rufus* which have been carefully studied, and it is not probable that the number will be found to differ in other species when examined.

These pieces are shown in the accompanying figure. The upper piece, pointed and gradually tapering from the base to the apex, is the *labrum*—

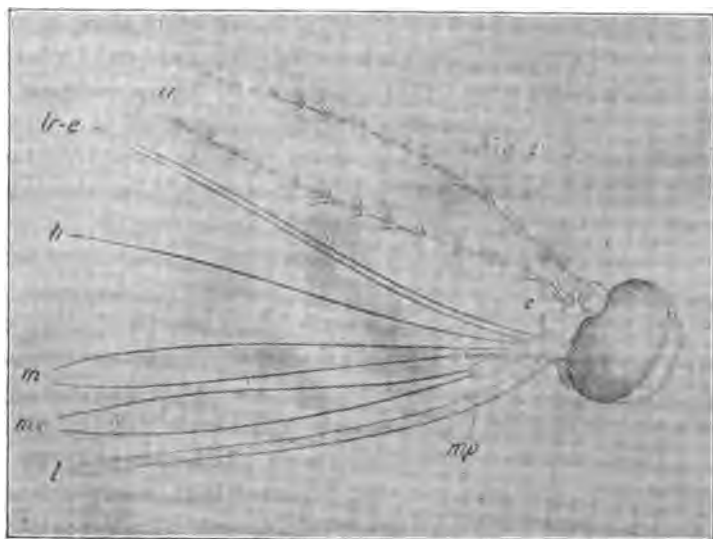


Fig. 9.—Mouth parts of the mosquito, lateral aspect. (After Dimmock.)

epipharynx, made up by the close union of the *labrum* and the *epipharynx*. Below it is the *hypopharynx*, a linear, lanceolate, transparent plate, having a longitudinal rod (appearing as if tubular in some species) traversing it in the middle, through which, it is thought, the poisonous fluid which we

have referred to is conveyed into the wound. With these two pieces pressed together, a channel is formed through which the blood passes as it is pumped up by the sucking-bulb, located in the head. The mandibles are the most delicate of the mouth-parts, consisting only of thin, linear-lanceolate blades of transparent chitin, slightly tapering in their width from their base outwardly. The existence of very fine serrations on their upper part (about forty-two on each) has lately been announced.*

The *maxillæ* are tapering, transparent blades of chitin, thickened on its upper edge and apparently toothed or serrated at the tip. Careful observation with a powerful microscope shows them to be not serrated at the edge, but the apparent teeth—about fifteen near the tip of each, are really papillæ placed on the upper surface of the blade. Aided by these papillæ, the service performed by the *maxillæ* is doubtless to draw the other mouth parts into the skin, as a slow gliding motion may be observed in first one and then in the other as all the parts are gradually buried. They are provided with muscles appropriate for the purpose.

The *labium* is the largest of the mouth-parts. It opens along its upper side in order to receive the other parts and to serve as a sheath for holding and protecting them when not in active use. When the proboscis is to be inserted, it acts in this manner: Its tip, consisting of two lobe-like appendages called *labellæ*, is closely pressed upon the surface. At once it is seen to bend backward or downward at the middle, releasing the contained parts—the *setæ*—which are held firmly together as they are driven into the flesh, guided and kept in place by the above named *labellæ* serving as a pair of fingers for the purpose. As they penetrate deeper and deeper, the labium or sheath bends more and more until when they have been buried to nearly their entire length—from having been at first elbowed, it is now bent double beneath the body.

The operation as above described is an exceedingly interesting one to watch. The labium is easily recognizable in any female mosquito that you will examine, appearing as a long projected beak, nearly as long as the abdomen, clothed with dark colored scales, and extending in front of the two delicately feathered antennæ given out from between the two large black eyes.

The relative position of the mouth-organs which I have briefly described, and the manner in which they are arranged in the sheath, may be

**American Naturalist*, xxii, 1888, p. 884.

understood from an examination of the accompanying figure, which represents a transverse section through the proboscis of the female at about its middle.*

The labium is seen wrapping itself nearly around the other parts. Above it lie the two maxillæ, partly inclosing the parts above it. Above them are the two mandibles, and above these, centrally, is the hypopharynx, with its thickened, middle, supposed saliva, channel. Above this is the labrum-epipharynx — the epipharynx of an omega-form, having the labrum closely attached to it. With the labrum-epipharynx slightly brought from its position as shown for convenience in the figure, so as to rest on



Fig. 10.—Mouth parts of the mosquito, cross-section. (After Dimmock.)

the hypopharynx, the channel for the passage of the blood, as has been described, is formed. In the continuation of this sucking-tube into the head, "in the posterior part of the head, it is enlarged in a large pumping-organ, which forces the imbibed fluid backward into the oesophagus and stomach" (Macloskie).

Uses of the Mosquito.

I have spoken of the mosquito as the most universally annoying of all our insect pests. Why then, it may be asked, was it created, and does it serve any possible good in the economy of the world?

The naturalist, as his acquaintance with nature becomes more extended, and the range of his studies widens so as to open up to him an insight into the interdependence of all animated nature, is led to accept the belief that nothing was made in vain, and that not a single one of the typical forms now in existence could be withdrawn without breaking the chain that binds all nature together in one harmonious (if properly interpreted) whole. This belief brings to him a faith that compels him to accept as of use whatever object owes its existence and preservation to the hand of its Creator and Guardian, although in his limited knowl-

* This and the preceding figure are copied from Plate 1 of *The Anatomy of the Mouth-parts and of the Sucking Apparatus of Some Diptera*, by George Dimmock, Boston, 1881.

edge, he may not be able, in all cases, to assign the purposes for which it was made.

Do not misunderstand me. I do not object to the destruction of noxious animals when our lives are endangered by them, nor to a very great reduction—even to the extreme extent of our ability—of the overwhelming numbers in which some of our insect enemies present themselves, depriving us of comfort, withholding from us luxuries, and robbing us of material wealth and at times of the necessities of life. To such a reduction, my studies and labors as you know, are being constantly directed. But it is only against excessive numbers that the economic entomologist contends—an excess that did not exist when first “God saw that all was good”—which could not exist under the operations alone of the laws of nature, but which do exist as the result of the unnatural, excessive, and often improper demands of our present form of civilization and society. Briefly, it is right and proper to restrain; it would be wrong, we think, had we the power to utterly exterminate.

But to return to the question. We do know one purpose which the mosquito serves, and one of considerable importance in a sanitary point of view. It serves to purify standing waters and to a great extent to lessen their malarial influences. The natural habitat of the larval mosquito is the stagnant water of our miasmatic swamps. The entire food of the creature from its birth to its maturity is believed to consist of the decaying vegetable matter which is here found in abundance, together with other impurities which it draws from such waters. Its agency in the purification of standing water may be easily shown. If during the summer months two barrels of rain-water be placed side by side—the one open to the atmosphere and the other covered with a thin netting, the following result will be obtained: The open one, after a few days has elapsed, will be found to abound with the larvæ and the pupæ of the mosquito, and its water sweet; the other, the netting of which prevented the visits of the mosquitoes for the deposit of their eggs, and consequently without larvæ, will have become foul and offensive.

We need not refer to an important role which the insect in its superabundance plays, as food for fishes, since that is but in accordance with a seemingly universal rule controlling all of the lower orders of animated nature, viz., “eat and be eaten.”

In view of this general law, seemingly fraught with so much suffering, how fortunate it is, we may remark incidentally, that many of the lower orders which are doomed to a perpetual sacrifice to the Moloch, appetite—insects, for example—have organisms so constituted that they are

almost without a consciousness of pain. Thus the rapacious dragon-fly — ~~the~~ hawk of the insect world — would quite as readily eat its own abdomen, as actual experiment has shown, could it conveniently be brought within range of its powerful jaws, as to indulge in its favorite and ordinary mosquito diet.

Newspaper authority — not always the best in matters of science — has lately (last year) given us another mosquito “boom,” in the announcement of the discovery that the Cuban mosquito was about to signalize a great advance in the science of Therapeutics — to serve no less a purpose than an effectual preventive of the fearful disease of yellow fever. The method of protection was simple in the extreme. A bottled mosquito must be applied to the person of a yellow fever patient and permitted to imbibe a little of his blood. Transferred, after a few hours, to the arm of the individual to be protected, the virus received would be conveyed with or through the proboscis, and a successful and complete vaccination against yellow fever will be accomplished.

The Mosquito as a *Filaria* Host.

If the above be only a fanciful conception of some “newspaper man,” as it possibly may be, the fact that the mosquito may communicate disease, or aid in its distribution, rests on a scientific basis. Some recent anatomical investigations of a species known as *Culex mosquito* inhabiting tropical regions, have shown it as serving a most unexpected purpose in acting as an intermediary host in the life-development of a thread-like worm,—a species of *Filaria*. This hæmatozöon, bearing the name of *Filaria sanguinis-hominis*, is found in its immature or larval stage in the blood of persons afflicted with elephantiasis and some of the allied diseases which are endemic over the more thickly populated tropical portions of the world.

Before the filariæ can undergo their full development they have to enter some other organism quite different from that occupied by their larvæ. The female mosquito above named (and probably other species also) acts as the host in this instance. As she drinks the blood of the diseased person, she imbibes with it the larval filariæ. Within her abdomen they undergo further transformations. Six distinct stages have been recognized within her. As she returns to the water for the deposit of her eggs—with her death occurring soon after oviposition, the filariæ which she bears in their perfected stage, are consigned to the water. In drinking the water, the parasites are received into the human stomach, from which they pass to, and enter, the lymphatic vessels, and by their

presence, under suitable conditions, produce the painful, loathsome, and often fatal disease of elephantiasis. (See Science, for May 18, 1883, i, pp. 419-420, for an extended notice and illustration.)

The Mosquito Perhaps One of the Ten Plagues of Egypt.

Professor Westwood, of London, an eminent entomologist, and the author of a volume on insects of such exceeding value that it is known as "The Entomologist's Bible," has endeavored to show that the mosquito was the insect that composed the "swarms of flies" that were sent upon Pharaoh and his people as one of the *ten plagues of Egypt*. In evidence of this, he cites the expression "swarms of flies," and remarks: "We are sure that every one who has seen a swarm of gnats at eventide, will perceive the aptness of the expression, supposing the Egyptian fly to be a species of gnat, or in other words, the mosquito. We next read of their making their way into the houses, which shall be full of flies. This is also precisely the habits of the *Culicida*." The distinguished Doctor of Science (like an eminent Doctor of Divinity of our own city), evidently favors "a reduction of the miraculous in the Bible to the minimum," and a non-resort to a miraculous interpretation of such phenomena as may be explained by natural causes; for he finds the fullest corroboration of his view of the mosquito being the plague insect, in the fact that the land of Goshen, in which the people of Israel dwelt, was to be exempt from the swarms of flies that invaded the land of the Egyptians. The latter, he remarks, was subject to a periodical overflow of the Nile—a condition most favorable to the production of mosquitoes; while the land of Goshen, was not overflowed and was a sandy soil entirely unsuited to the mosquito, and even at the present time, a favorite place of refuge for cattle from its attack.

Others, who have written of this plague, entertain different views—among which, Rev. Mr. Kirby, finds strong evidence of its having consisted of cockroaches. Opinions might differ as to which would be the greater plague.

Eggs of the Mosquito.

The transformations of the mosquito, to which we now pass, are of much interest, as I hope to be able to show you.

While the eggs of a large proportion of our insects, either from their form, color-markings, sculpture, or manner of deposit, offer many attractive features, those of the mosquito possess special and unusual interest from the singular disposition made of them.

The individual egg is of an elongate-oval form, rather pointed at the upper end, broader at the lower. They are deposited in a mass, on the surface of the water, in the form somewhat of a boat, and left to float freely about. The little egg-boat, not exceeding a tenth of an inch in length, yet bearing nearly a hundred lives, is built in the following manner: The insect takes her position on some object in the water—a floating leaf or stick it may be—holding to it by her anterior legs, while her long abdomen rests on the water with its tip slightly elevated. Crossing her posterior pair of legs (which are much longer than her body) behind her in the form of an *x*, she places an egg in a perpendicular position at the point of crossing—the inner point, nearest the tip of her abdomen: this forms the keel of the boat. To this two eggs are next attached in the form of a triangle. The eggs are coated with a glutinous matter, causing them to adhere closely and firmly to one another. Successive additions are made to these in a gradually enlarging outline, as regulated by the angle or curve formed by the legs. When the boat is about half built, the legs are uncrossed and placed side by side underneath for better support, and in this position the remaining portion of the boat is completed in a symmetrical form, although unaided by the eye and only guided by the delicacy of touch. When finished, the supporting legs are withdrawn, and the tiny craft is launched, and left to be driven about hither and thither by the winds, yet ever drifting securely, without the slightest risk of sinking to the bottom or of being overturned. For experiment's sake, you may place one in a basin of water and pour gallons of water on it, without being able to overturn it. You may even thrust it by force to the bottom of the vessel, whence, as soon as released, it will rise to the surface, right side up and not holding in its concavity a particle of fluid. It is a veritable life-boat.

The Larval Mosquito.

The eggs hatch ordinarily in from two to three days, dependent, of course, on the temperature of the water. The larvæ that they produce are familiar to all who have been in the habit of using rain-water during the spring or summer months which had been exposed to the open air for a few days. Children living in the country often know them under the appropriate names of "wrigglers" or "wrigglers," drawn from their peculiar jerking motions as they come to the surface of the water to draw in a supply of air and to hang motionless, head downward, for awhile, or with the same motion descend to the bottom to feed. They have a distinct rounded head with mouth-parts, antennæ and ciliated ap-

pendages, an enlarged thoracic region, and a long ten-jointed abdomen, slightly tapering, with each segment bearing bundles of hairs. From the eighth abdominal segment a long tubular organ is given out, ending in a star-like structure bearing a number of ciliæ. This is its organ of respiration—all the air that it receives being supplied to the tracheal vessels only through this opening. The terminal joint of the abdomen bears five conical plates which are used in its locomotion.

The Pupal Mosquito.

After several moltings, while they rapidly increase in size, the larvæ enter upon their third stage of existence, in assuming the pupal stage. At this time they present an uncouth aspect. Their thoracic region has become greatly enlarged, and in front of it are grouped, in separate cases, the legs, wings, mouth-parts and antennæ. They still continue in an active state, unlike the quiescent pupal condition of many insects, and even many other Diptera—but they are incapable of feeding. A striking and interesting change has taken place in their breathing apparatus. They suspend themselves from the surface of the water, as before, for respiration, but the air is now taken in through two horn-shaped organs proceeding from the upper part of the thorax. Before, they hung head downward; now, as they have made a material advance in development, more fittingly, head upward.

In about two weeks, usually, from the deposit of the eggs, the pupal stage is completed, and the insect is prepared to enter upon its final state, a perfect, winged insect. With so brief a period required for its development, you will perceive that there is ample time for several generations of the insect during the spring and summer months.

The Final Development.

The pupa having fully matured, it rises to the surface of the water where it floats with its thorax elevated above the surface. Exposure to the air dries the exposed portion, and, aided by movements within, it splits along the middle line, and the head and thorax of the inclosed insect are thrust out. Slowly the wings, legs, other organs and abdomen are drawn forth through alternating muscular extension and contraction—all the while balancing itself in an upright position with the utmost care, for the problem of how to maintain the center of gravity when elevated so high above its frail and unstable base must necessarily be an exceedingly difficult one—it would seem to be an impossibility. The slightest

excess of lateral deviation, either from defective instinct or from a current of air, is at once fatal. The float—a mere transparent film—with its occupant, is thrown upon its side; the wings are wet and no longer serviceable, and the new life just opening, is ended. This fatality is common—indeed it is represented as the rule—the contrary, the exception. Each such occurrence, although a tragedy, need not evoke our sympathy although so oft repeated. Food is thereby furnished fishes and other living forms, and there will always be quite as many mosquitoes left as are required for sanitary uses.

With those that are so fortunate as to escape this perilous evolution, a short time suffices for the expansion of their wings through the entrance into their veins of air and blood, and to dry and fit them for flight. Just the manner in which the pupal-case is abandoned, is not definitely known; it may be with the feet resting upon its edge; or it may be as represented in some illustrations, that, carefully preserving its equilibrium, the insect bends forward and rests with its fore-legs on the water—a moment passed, perhaps, in admiration of the delicate form mirrored therein—when the wings are spread, and with their rapid vibration of five hundred beats a second emitting music though familiar yet not sweet to human ears—it launches forth into its new element, in quest, as it may be, of nectar, or of blood.

The mosquito is gone! Are you not glad, for with her flight ends my paper.

[Those who would like to consult some recent publications and studies upon this interesting insect are referred to the following:

HOWARD: in Bull. 4 N. Ser., U. S. Dept. Agricul., Division of Entomology, 1896, pp. 9-24, figs. 1-4.

LUGGER: 2nd Rept. Entomol. St. Exper. Stat. Minn., 1896, pp. 182-195, figs. 152-158.

OSBORN: Bull. 5 N. Ser., U. S. Dept. Agricul., Division of Entomology, 1896, pp. 25-30, figs. 1, 2.]

A PLEA FOR ENTOMOLOGICAL STUDY.

[Read before the Agassiz Association of the State Normal College,
Albany, May 18, 1894.]

The Association which I have the honor and privilege of addressing, I have the right to believe, from its connection with an institution which, in the annals of education, has won an enviable reputation for the careful, systematic and thorough training it aims to give to all its pupils — is not only desirous of promoting to the extent of its ability investigations in various departments of Natural History, but that it is also able to do excellent work and render good service toward this desired end.

I therefore esteem it a privilege to appear before you to-day, and ask your earnest co-operation in that department of study in which I am specially interested, and to which so large a portion of my life has been devoted. I appreciate, to some degree at least, the almost infinite extent and variety of the Museum of Nature. On every hand and in every direction, objects of interest invite our observation and study. Excluding what lies beyond the sphere upon which we dwell — there are the rocks to which we owe our basis for study, and their contained fossils, telling of the forms that peopled this globe eons of ages ago; the vegetable world instinct with life and beauty and wonderful processes of growth and development, and crowned with the dignity of being the agency through which alone, directly or indirectly, existence is possible for each and every mammal, bird, reptile, fish, insect, myriapod, crustacean, worm, mollusc, protozoan — of all the myriad living forms that people our globe.

In each of the several classes of the mineral, vegetable and animal kingdoms, there is abundant work for the earnest student. There are collections to be made; elements, form and structure to be studied; habits to be observed; preparations for study and for preservation; comparisons to be instituted, forms new to science to be detected and illustrated; descriptions to be drawn and published, and name and systematic place to be given to each and every one.

Why, then, should I make a special plea for the study of the Insect world? I would not presume to do so, unless I felt that I could give you sufficient reasons for making the claim; of these, I offer,

I. The Mental Discipline that the Study Affords.

This should especially commend it to the young student, where the intellectual faculties are to be developed and strengthened, and the mind

guided and formed into proper habits of observation, thought and expression. To these ends, I believe entomological study to offer better discipline than the study of mathematics or the classics to which so much time is devoted and far beyond what may, by any possibility, in a large majority of students, be of any material practical importance.

But why may this be accomplished through the study of the insect world, better than by some other branch of natural history? We answer: because of the greater number of objects that in a given time may be brought together for study — the insect world presenting, as it does, by far a larger number of species than all the other classes of the animal kingdom combined. With this almost boundless number of species, it follows that there must often be but minute differences between them, not perceptible but through careful comparison, and often demanding the microscope for their detection. It is impossible that any one who has made a collection of insects of considerable size — separated them in their usually accepted seven orders, named such as he has been able to with the literature at his command or by comparison with other scientific collections, and arranged them systematically in proper cases, in their families, genera, species, and varieties — could have done this without having greatly strengthened his faculties of observation, comparison, discrimination, memory, and having acquired habits of study, industry, delicate manipulation, order, neatness, precision, and the like, which shall serve him in whatever position in life he may be placed, and cling to him to his life's end.

II. The Facilities for Entomological Study.

The entomologist, if unable to search for his material — we will not say, if not caring to seek it, for a lazy naturalist would be an anomaly — may have abundant material come to him unsought. As he walks the street, "the shard-borne beetle with its drowsy hum" flies in his face or alights upon his clothing; the moth sits at rest upon a tree-trunk or fence-paling as if asking for admiration and capture; the caterpillar drops upon him by its silken thread from an overhanging branch, or exposes itself as it travels over the sidewalk, to his meditative downcast gaze. Rapt in study in the seclusion of his room, the sudden thrust of the sharp lancet of *Stomoxys calcitrans*, causes its capture and invites examination of the curious projecting blood-sucking apparatus which, without critical observation, seems the only difference between it and the harmless common house-fly; or, curiously plumed creatures of delicate forms and colors, attracted by the light upon his study-table, will flit over his paper to mar

his penmanship and perhaps end their life in a bath of ink, as they are doing at this present while writing of their obtrusiveness.

The invalid, who may be held a captive within his home through physical weakness or other infirmity, during the months when the insect world holds its hey-day in the fields and forest, may still make ample collections for study and enrichment of his cabinet even within the confines of his chamber. Should the year be favorable for insect life (the years vary greatly in this respect), at least five hundred species could be taken by him. Does this surprise you, as an indoor collection for a single year? I believe it a moderate estimate. To many of you, perhaps, all the flies of our window seem alike, or the smaller forms are regarded as the young of the common house-fly. Yet I would engage that from the windows of a single room of one's house, during the months of March to November inclusive, there could be taken one hundred species of Diptera alone.

Insect collections are easily made, and with simple and inexpensive material. For our ordinary walks in the requirements of business or study, the "cyanide bottle," that comparatively recent invention, yet now regarded as indispensable to the collector—is all that is needed for securing most of our insects. To the cyanide bottle, of a size convenient to be carried in a pocket, should be added a small tin box for inclosing caterpillars or other larvæ, with some of their food if desired to rear them. For field excursions, we would multiply our bottles and boxes, and add a suitable net, a pin-cushion with insect pins of two sizes, and a box hanging from a button or belt in which to pin the collections.

III. The Interest Attaching to the Study.

I dare not urge this topic as I feel to do, for fear that you would receive what I might say as the extravagance of enthusiasm. If not prepared to accept the assertion, that in no department of natural history can you find so much to interest you, and to interest you so deeply, as in the study of insects, their transformations and their habits, then, if willing to test the truth of the assertion, will you please accept for guidance the following program:

Get the cocoons of some one of our larger silk-spinning moths, of the family of *Bombycidae*,—let them be, if you please, of *Attacus Promethea*, which you may find at the present time upon your lilac bushes, infolded in dried-up leaves of last year's growth. Before you cut the cocoons from the twigs (you can hardly tear them off by hand) first observe the silk extending from the cocoon, enveloping the leaf-stalk and then encir-

cling the twig, binding the leaf securely to it, and holding it there during the falling of the other leaves and through all the winter's storms. Inclose the cocoons in a box of sufficient size to admit of the expansion of the wings of the moth and some freedom of motion when it comes from its cocoon. On some morning in the month of June, (earlier if they have been kept in a warm apartment) if your cocoons contained living pupæ, you will find that the moths have emerged, and deposited a large number of eggs, cementing them to the sides of the box. Note the regularity of form and size of the eggs, each with its yellowish spot upon its somewhat flattened upper side. When two or three weeks thereafter, the eggs commence to hatch, with a magnifier in hand, watch the enclosed caterpillars eating their way out of the shells, always at one side, and through a somewhat oval hole.

Transfer them carefully to some tender leaves of their food-plant, and observe their social habit of grouping themselves side by side like soldiers on parade, and their manner of eating. After you have watched them for a week, and noticed perhaps with fear of the result lest it should betoken incipient disease, their fasting for a day or two, you will find them materially increased in size and in a new dress of light green with bands of yellow, bordered with black, and rows of white-bristled tubercles studing their body. This is their first molting, or casting of their skin to admit of increased growth. Four or five times you may observe a similar molting, followed each time by a new and more beautiful garniture. As the caterpillar approaches maturity you will surely be compelled to regard it as a beautiful creature, with its creamy pruinescence, its bands of dark blue tubercles on each ring, its four rich coral-red horns on the front of its body and a yellow black-ringed one at its other extremity. Carefully observe the row of spiracles or breathing pores upon the sides of the body through which the air is admitted to the tracheal vessels, and the peculiar structure of its many-hooked clasping legs. It is indeed a wonderful creature,—not “a worm” as ordinarily stigmatized, but a being which its Creator has dignified with the possession of eight times the number of muscles that are to be found in the human body; and in every way worthy of your study and admiration. When through your watchful care, your little colony have attained their growth, to your great relief from providing them with an adequate supply of their daily food, do not fail to have your eyes upon them as they throw out the first threads that are to bend the leaf in shape for enfolding their cocoons, preparatory to passing to their pupation. The leaf may hardly be more than marked as the chosen one, before you may see the busy

spinner leaving it, and commencing to cover the leaf-stalk with a firm envelope of silk, which, when completed, will be stronger than you can break without forcible pulling. You will now be given a favorable opportunity as the caterpillar's head sways from side to side, to note the two silken semi-fluid threads emitted from the pair of projecting spinnerets beneath the mouth, but uniting and drying at once in a single thread. The intelligence that leads the caterpillar next to bind securely the enveloped leaf-stem to the twig by throwing band after band about it, and in the event of the twig being a delicate one and liable to be broken off, then, in addition, securing the twig by the process above mentioned to its parent stalk — can not fail of amazing you. Do you think it simple instinct, working in one unvarying line inherited from its ancestors, and incapable of adapting itself to different or changed conditions? Then try the experiment that I once made, and learn your error. When all of this preparatory work has been completed, each lashing examined over and over again, and finally pronounced all right by its artificer — then with a sharp blade of your knife, quietly and neatly sever the leaf-stalk just where it is bound to the twig and, replacing it with accurate adjustment, insert a fine insect pin to hold it in place. You will not have long to wait before the spinning of the cocoon will be arrested and a reconnoitering expedition commenced. Your treacherous work is discovered as soon as the point is reached. The situation is at once taken in — the danger, the necessity of meeting it, and how best to do it, fully comprehended. You may not read in the microscopic eyes of the caterpillar, the successive phases of anxiety, alarm, distrust, annoyance, anger, resolve, triumph, but you may see him apply himself to the task of lashing anew the foot-stalk to the twig and thus bid defiance to your perfidious pin, around which he throws his silken threads, until the severed stem is stronger than before. What else is this than reason!

The shaping and formation of the cocoons will be of interest to watch, until the thickening walls have hidden the larva from your view. During the winter, you may sacrifice one or more of the number by making sections of them, that you may observe the structure of the double cocoon — one within the other, with the intermediate loosely-threaded non-conducting air-chamber, and the contained pupa, with its wing, leg, and antennæ-cases folded upon its breast, and the cast-off caterpillar skin compacted in a pellet behind it.

Your study of this life-history will not be fully carried out to its proper completion until, in the following spring, you can see the moth emerge from its cocoon. A strange looking object will it seem in your eyes, as with a brisk movement of its legs, it clambers upward to some position where its unexpanded wings may hang downward, limp and wet, over its

back. Watch the gradual but rapid expansion of the wings, as they grow before your eyes—the two membranes of which they are composed steadily distending as the circulation from the body is forced into the veins that lie between. The innumerable wrinkles of the membranes are smoothed out; the scales that are implanted in them also increase in size, until within perhaps half an hour the wings have assumed their full development, and display their perfect ornamentation, in patterns resulting from the combination of nearly half a million of individual scales—the most delicate imbrication that may be found in nature, and far surpassing any thing that art can produce.

If not deterred by my long recital you will undertake what I have proposed—to follow out the life-history of one of our silk-worms, and having done so, if you do not find that the study has been one of surpassing interest, leading you to further study of the kind, and wedding you to entomology—then you have been given or have acquired a nature that I can not comprehend.

IV. The Practical Importance of the Study.

It is universally conceded that Agricultural pursuits form the basis of National prosperity, and that upon the products of the soil our existence is dependant.

The existence of the insect world also depends upon vegetable life: hence arises that constant antagonism of man to the insect world, which becomes so intensified when through his agency as a cultivator of the soil, there results excessive multiplication of injurious species preying upon crops which he deems essential to him.

Every crop grown is exposed to their attack. It has been estimated that there are upon an average, six species of attacking insects to each known plant. From their minute size and the secrecy of their depredations, we can not fence them out, as we do our large domestic animals. Probably there is no cultivated crop which is not lessened by one-tenth through insect injury. Often there is a diminution in yield of one fourth; frequently of one-half, and at times there is a total loss, as when during the prevalence of the wheat-midge, forty years ago, entire fields of wheat were left uncut in New York and other of the wheat states, and for a term of years wheat could not be grown. In one year, in our State (1854), the loss from this tiny insect was calculated at fifteen millions of dollars. Illinois suffered in a single year, in its wheat and corn crops, to the amount of seventy-three millions of dollars, according to estimate, from the ravages of the chinch-bug (*Blissus leucopterus*). True, these were exceptional years, but from another insect pest, the cotton-worm

(*Aletia argillacea*), annual losses to the cotton-crop of the Southern States are sustained, it has been calculated, of thirty millions of dollars.

From careful computations based upon the census returns of agricultural products of the United States, the startling aggregate is presented of an annual loss in these products of three hundred millions of dollars.

A large proportion of this loss—this onerous tax upon industry—need not be sustained—need not be exacted. It is preventable through the use of means which have been and are being indicated by those who have undertaken the study of methods of prevention and remedy. In consideration of the progress that has been made in the knowledge of insects, the discovery of insecticides and of mechanical appliances for their application to field crops, as well as to orchards and gardens, I dare to assert that the insect does not exist, the injuries from which may not be materially lessened whenever its habits and life-history have become fully known.

The need of the study of these insect depredations, the importance of it, and the absolute necessity thereof, will be more evident when we consider, next

V. The Extent of the Study.

A comparative idea of the magnitude of the insect world, as contrasted with the entire animal kingdom, has already been given you. It may enable you to form a better idea of its extent, to state, that judging from the number of species now named and described—about 330,000 (we know and possess in our collections thousands of others awaiting study), and at the rate that new species have been added to our lists within the last half-century—it will not be an extravagant estimate, if for the present, we place the probable number of species existing in the world at one million. Although this figure is largely in excess of those made by other entomologists, I believe it to be a moderate one, in consideration of the limited study as yet given to some of the orders, and the still unexplored regions of the globe—entire continents in which scientific exploration has barely commenced. Its realization would but necessitate *less than the trebling* of the at present known species, with all future time available for the work; while during the years that have followed my boyhood, the number of described species has been *quintupled*.

From a scientific point of view, each species as discovered demands description that will give it positive recognition, and assignment to its proper place in classified lists. For economic purposes, but a small proportion will require the elaborate study that shall tell us all that we need to know of them. But what patience, what persistence, what an amount of study—extending it may be over several years—is often needed for the acquisition of a single life-history. Each of the four stages under

which insect life is presented to us—the egg, the larva, the pupa, and the imago, must receive its share of attention. The varied habits are to be observed and noted, under the complications frequently existing of change under changed conditions of food-plant, climate or locality.

The extent of the study will further appear from a consideration of the omnipresence of insects. As I have elsewhere written, “they abound in our homes, our gardens, orchards, fields, vineyards and forests. In the vegetable kingdom, they are found in the seed, the root, the stalk or trunk, the pith, the bark, the twig, the bud, the leaf, the blossom, and the fruit—within or upon every portion of the vegetable organism. They are parasitic on our persons and upon or within all of our domestic animals. They attack and destroy fishes and birds. They have their natural home in many articles of food. By their disgusting presence and annoyance they may render our homes untenable. They burrow within our household and agricultural implements. They destroy our furniture and our clothing. They occasionally take possession of our books. No asylum is so secure that they may not intrude; no condition in life is exempt from their presence and attack.”

VI. The Study has not been given its proper Share of Attention.

If you have followed me as I have attempted, in the brief time that I dare claim on this occasion, to show you the value of the Study of Entomology as a mental discipline—the facility with which it may be pursued—the interest attaching to it—its great practical importance—and the broad range that it embraces, you will, I think, agree with me, that it is very far from receiving the attention that it deserves and may justly claim. Notwithstanding the enormous losses annually sustained from insect depredations, how very few comparatively there are among us who can properly apply the familiar names of “bug,” “beetle,” or “butterfly.” There are those whose crops are annually depleted, needlessly, to the amount of hundreds of dollars, who do not know that the caterpillar is but an immature stage of the winged moth or butterfly. This day, I find in a pretentious journal a notice of a destructive insect to this effect: “The insect appears first in the form of a small moth. In a few days, it sheds its wings and becomes a caterpillar, and a week thereafter it lays its eggs, each caterpillar producing two hundred.”

In how many of our public schools and academies is Entomology given place? I do not know of one. In nearly all of our higher institutions and private schools, Botany is taught, and yet the former is certainly of far greater importance in the broad range of its economic applications. The State Normal College at Albany and the Oswego Normal School, have given excellent entomological instruction. Cornell University sus-

tains a Professorship in Entomology, with courses of lectures, laboratory work and Museum. Lectures in course upon it are given at Harvard University, the State College of Maine, the Massachusetts Agricultural College, the Michigan State Agricultural College, Purdue University at Lafayette, Ind., the Illinois Industrial University, the Iowa Agricultural College, the Kansas State Agricultural College, and the Leland Stanford Jr., University in California. In each of these State Institutions particular attention is paid to the economic aspect of the science.

The above, with the exception of some academic instruction in other States is the sum, so far as known to me, of what is being done in our institutions of learning in this department of Natural Science.

The reason for its almost entire neglect in our schools, is, undoubtedly the want of text books adapted to the young student. It might have rivaled Botany in popularity could its collections be named with the facility of plants. But for this we may never hope. The volumes that would be required for the simple identification by means of three- or four-lined diagnoses of the known United States species of insects, would be, at least, twenty of the size of Gray's School and Field Book of Botany—a series which would certainly prove inconvenient for general class use. A reference catalogue alone of the Diptera (flies) of North America, forms a volume three-fourths the size of the one above named; and a catalogue of the known Insects of the small State of New Jersey, giving name and occasionally brief annotations of locality and distribution, fills 486 pages octavo.

We should not wait for the desired text-books, such as will enable us to name our collections, for there is much else to learn of insects besides their names, as, for example, their structure, habits, transformations, and economic value. With "Packard's Guide to the Study of Insects" and "Comstocks Manual for the Study of Insects," in the possession of the student for reference, and with the insects before him upon his table, the teacher, having qualified himself for the work, may, in a series of lectures give to his class a better foundation for future study than could be acquired from books alone.

I lately had the privilege of attending one of the Lowell Institute Free Course of Lectures on Zoölogy, at Boston, given to the teachers of the Public Schools. Each of the about three hundred teachers in attendance had upon his or her table a box containing a half-dozen representative species in the order of Neuroptera, and a vessel of water in which were some macerated specimens with which to study structure. The lecture was further illustrated by diagrams and charts upon the wall. I was delighted with the lecture, and with the promise that it gave of the

good to result, when these trained teachers would form centres of similar instruction to other classes elsewhere.

In conclusion, if my plea for entomological study shall meet its desired response in inducing some of you to become faithful laborers in this broad field, where so large an amount of virgin soil is to be upturned, so much tillage is required, and such abundant fruit to be gathered — then, let me further ask of you, not to rest contented to gather for yourselves alone, but that from your superabundant stores you may make large contribution to others. Emulate the example of him whose honored and revered name your association bears. Ever find your greatest incentive to study, not in that it enriches yourself, but that you may impart to others. So gather from Nature's exhaustless stores and so distribute that your fellow-men shall be made the better, wiser and happier from your having been permitted to serve as Nature's interpreters.

More of honor than regal crown can bestow is in that single word, chiseled on a glacial block borne from beyond the seas to mark, so fittingly, the grave of Agassiz at Mount Auburn — TEACHER.

(C)

LIST OF PUBLICATIONS OF THE ENTOMOLOGIST.

The following is a list of the principal publications of the Entomologist during the year 1896—thirty-eight are named—giving title, place and time of publication, and a summary of contents.

On the Girdling of the Elm Twigs by the Larvæ of *Orgyia leucostigma* and its Results. (American Naturalist, xxx, January, 1896, pp. 74—75—17 cm.)

Its annual depredations in Albany; a new form of attack noticed in 1883, viz., girdling of the tips of the twigs; cause of the girdling; the girdling operations of a second brood of the *Orgyia* in August, 1895; a second brood not previously recorded in Albany; a feature shown in the twigs girdled by this brood; no similar girdling seen on any other of the *Orgyia* food-plants.

[Republished in pages 124—126 of the Eleventh Report.]

Wire-Worms in Corn. (Country Gentleman, for February 20, 1896, lxi, p. 144, c. 1—18 cm.)

Wire-worms reported as injuring corn seriously at Mullica Hill, N. J., the previous year. Buckwheat and mustard crops as preventives of wire-worms. Kainit possibly a remedy, although it gave unsatisfactory results at Cornell University. Baits of poisoned clover for the beetles recommended; midsummer plowing for destroying pupal cells and their occupants; rotation of crops; keeping fields in sod but a year or two at a time; thorough cultivation in autumn.

A Solution for Killing Worms. (Gardening, for March 15, 1896, iv, p. 199, c. 2—5 cm.)

Replying to an inquiry of a solution for killing worms, grubs, etc., in potted plants and on benches of greenhouses, several are named, as pyrethrum water ($\frac{1}{2}$ ounce to two gallons of water), quassia water, tobacco water, mustard water, and lime water. Vegetable solutions would be less liable to injure the roots of the plants.

The Apple Maggot, *Trypeta pomonella*. (Gardening, for April 1, 1896, iv, p. 218, cols. 2, 3—21 cm.)

The insect is stated to ruin annually in Western Massachusetts the fruit of several varieties of apples; inquiry is made of remedies. Reply is given that preventive measures must be mainly relied on. The parent insect flies from early July until frost,—the females

depositing their three to four hundred eggs singly beneath the skin on all parts of the apple. The eggs hatch in four or five days; mining habits of larvæ; they naturally pupate under ground. Destroying fallen fruit at once, using decoy trees for receiving the eggs, compacting the soil beneath trees or stirring it frequently, is recommended.

Apple Maggot. (Country Gentleman, for April 2, 1896, lxi, p. 270, c. 3 — 13 cm.)

It is reported as doing much damage to young apples in Fond du Lac county, Wisconsin; spraying is proposed. In reply, it is stated, that arsenites are of no value against this insect [*Trypeta pomonella*]; a good coating of the fruit with the Bordeaux mixture might prevent oviposition. General failure of the crop would probably reduce the numbers of the fly the following year, as it is sluggish and would hardly fly far. It can also breed in wild haws and crab apples. Best remedies: destruction of fallen fruit and using decoy trees. Arsenical spraying should not be neglected because of comparative exemption from insect attack.

The Cheese Skipper. (Country Gentleman, for April 9, 1896, lxi, p. 293, c. 2 — 28 cm.)

In response to inquiry, the meat-skipper is identified as the one found in cheese, viz., *Piophilæ casei* (Linn.). The perfect fly hibernates, appearing in warm weather in spring to oviposit; duration of stages. Long known only in cheese; in recent years infesting meat; losses caused in packing houses. Skippers reported from Moorefield, W. Va., on salted meat in January. Remedies: storing these products in darkness; excluding the flies. The work of the skippers does not produce ill odors or putrescence.

[Extended in pp. 229-234 of this Report (xii).]

Scale Insects. (Gardening, for April 15, 1896, iv, p. 234, c. 1 — 14 cm.)

Scales on apple trees from Milwaukee, Mich., are identified as *Mytilaspis pomorum* and *Chionaspis furfurus*. Remedies are, cutting down when badly infested; for moderate attacks spray with kerosene emulsion reduced with nine parts of water when the young insects appear, or else from the middle to the end of May, for the latitude of Michigan.

The Southern Corn-Root Worm. (Country Gentleman, for April 30 1896, lxi, p. 353, cols. 2, 3 — 40 cm.)

"Bud-worms" which had nearly destroyed a field of corn in Fauquier Co., Va., are "the twelve-spotted Diabrotica," *D. 12-punctata* (Oliv.). The closely allied northern corn-root worm, *Diabrotica longicornis* (Say), is more destructive in the Northern States. Characters of the two species are given. The southern beetle is sometimes common North, and is a well-known pest of squashes, melons and cucumbers. The larvæ attack the corn just beneath the surface and cause wilting of the central leaf. Infested fields should not be replanted. No effective remedy is known.

Thousand-Legged Worms Infesting Greenhouses. (Gardening, for May 1, 1896, iv, pp. 251, 252, cols. 2, 3, 1—47 cm.)

Thousand-legged worms are reported as abounding in greenhouses at Kansas City, Mo., and not controlable by ordinary applications. From examples sent, the Myriapod is briefly described and identified as one of the flattened millepedes near to *Polydesmus complanatus* of Europe, which has not been recognized in this country. *Polydesmus Canadensis* is probably the species found to be so injurious by Dr. Fitch in this country. Many of the Myriapods feed only on decaying vegetable matter. Soot is said to drive them away. Kerosene or a strong kerosene emulsion will kill them; pyrethrum and hellebore might be tried. Baiting with chips, slices of carrots, etc., recommended. Removal of the manure in the house in which they may have bred is advised.

[Extended in pp. 300—303 of this Report (xii).]

A Handbook of British Lepidoptera. By Edward Meyrick. (The Nation, lxii, May 14, 1896, p. 385, cols. 2, 3—33 cm.)

In a review of the above work, its comprehensiveness, completeness, and general excellence is commended. It contains descriptive text of 2061 species. Analytical keys for the determination of the higher groups so complete have rarely if ever been given. Its new system of classification is noticed, based on the author's study for years, of the Lepidoptera of the World. The system is so revolutionary as to be almost startling, but it is presented as a natural one, as based on resemblances resulting from traced community of descent. It is in accordance with the views advanced in Darwin's "Origin of Species," and has apparently been so carefully elaborated that in all probability it will have to be generally accepted by American Systematists. From the intimate relationship of the Lepidoptera of Great Britain and of the United States, the volume will be almost indispensable to American Students of Lepidopterology.

Elm-Leaf Beetle. (Country Gentleman, for May 14, 1896, lxi, p. 386, c. 3—6 cm.)

Examples sent with inquiry from Gaylordsville, Conn., taken on an attic window, are identified as *Galerucella xanthomelæna*, now *G. luteola*. They had doubtless just awakened from their winter's sleep in the attic and when found were seeking to escape to the elm for feeding and subsequent oviposition.

The Harlequin Cabbage Bug. (Gardening, for May 15, 1896, iv, p. 266, cols. 2, 3—26 cm.)

Insects destructive to cabbage and cauliflower in Tracy City, Tenn., are the harlequin cabbage bug, *Murgantia histrionica*. Its northward spread from Mexico is noticed, also its habits, and method of destroying it by drawing the early insects to mustard, cabbage stumps and sprouts for convenient killing, and by crushing the eggs.

A Plum Mite. (Country Gentleman, for May 21, 1896, lxi, p. 406, c. 2—16 cm.)

Leaves of a Chickasaw plum from Muncy, Pa., are deformed with galls showing on both surfaces of the leaf, produced by a gallmite which is seen under a powerful glass. Judging from the character of the gall, it is identical with that of *Phytoptus pruni* Amerl., which has not been previously detected in this country. For the destruction of the mite, hand-picking and burning the infested leaves early in the season, and winter spraying with kerosene emulsion are recommended.

[See page 318 of this Report (xii).]

The "Fire Worm." (Country Gentleman, for May 28, 1896, lxi, p. 431, cols. 3, 4—12 cm.)

The canker-worm, *Anisopteryx vernata* (Peck), is defoliating orchards in Amenia, N. Y., where it has previously been abundant. It is proving quite resistant to Paris green, and one pound of the green to 100 gallons of water has been required for killing it. Its habit of dropping from the foliage and being carried on its thread by the wind to other trees is noticed. It is known in Amenia, as the "fire worm," as the trees after the infestation, look as if they had been swept by fire.

[See pages 311-312 of this Report (xii).]

On the Girdling of Elm Twigs by the Larvæ of *Orgyia leucostigma* and its Results. (Proceedings of the American Association for the Advancement of Science—Forty-fourth meeting, held at Springfield, Mass., August-September, 1895. May, 1896, p. 156—5 cm.)

A brief abstract of the paper under the above title was published in the American Naturalist for January, 1896. See page 347 of this Report.

Fruit Tree Aphides. (Country Gentleman, for June 11, 1896, lxi, p. 466, cols. 3, 4—12 cm.)

Some black aphides on cherry from East Hartford, N. Y., are identified as the cherry-tree aphis, *Myzus cerasi* (Fabr.), and the green ones on plum as *Aphis prunifoliae* Fitch. The former is a common and widely distributed pest, while the latter is much less so. Spraying the plant-lice with whale-oil soap solution or strong tobacco water on their first appearance is effective. After the leaves curl, the spray is not effective. The Syrphid larvæ found preying on the aphides would probably soon destroy them all.

[Kill the Larvæ of the Elm-leaf Beetle.] (Albany Evening Journal, for June 24, 1896, p. 4, c. 4—16 cm.)

The larvæ of the first brood are now descending for pupation, and by killing them with hot water or kerosene, the ravages of the second brood may be largely prevented. This method is simple, while general spraying is impracticable. Infested trees—confined almost entirely to European elms, are indicated by small spots on sidewalks ordinarily

left by the larvæ trodden under foot. The American elm in Albany is so far exempt from attack.

[Extended in pages 253-264 of this Report (xii).]

[Report on the Work of the Gypsy Moth Committee after an Examination made in June, 1893.] (The Gypsy Moth, *Porthetria dispar* (Linn.)—A Report of the Work by E. H. Forbush & C. H. Fernald [June], 1896, Appendix D, pp. xxxii-xxxv).

The pages cited contain (in part) a report made by the N. Y. State Entomologist, following an examination, at the request of the Committee, of their operations. As the result of the examination of the field and office work, and at the Insectary, nothing was found to criticise. Liberal appropriations by the State Legislature and a continuance of the work of the Committee were recommended. Two suggestions were offered, viz.; that the entire service of the Entomologist, Prof. Fernald, be secured, if possible, and that the cultivation of parasites be entered upon and vigorously prosecuted, somewhat on the plan of which an outline is given. Possibly by this means only, can extermination of the moth be effected.

The Elm-tree Beetle in Albany. (Albany Express, for July 1, 1896.)

Gives the progress of the insect up the valley of the Hudson river since its appearance at Newburg, N. Y., in 1879, until its invasion of Albany in 1892; also, its slow spread in Albany and best methods for its destruction.

Rose Bugs. (Gardening, for July 1, 1896, iv, p. 311, c. 2—11 cm.)

A correspondent, Mrs. Chrisman, states that rose-bugs may usually be traced to a hatching ground, where they could be killed by the application of a few sacks of salt. The editor requests comment on the above. It is given to the effect that the correspondent has undoubtedly been successful in tracing the rose-bugs in her neighborhood to a common hatching ground in a swamp, and draining the locality is suggested as a remedy for the continued breeding. Salt, as suggested, may prove effectual, and it would be well to experiment with it.

Tenth Report on the Injurious and Other Insects of the State of New York for the Year 1894. Albany, 1895. [Issued July 8, 1896.] Pages 297, plates 4, figures 24. (Forty-eighth Report on the New York State Museum, for the year 1894. Albany, 1895, pp. 297, plates 4, figs. 24.)

The contents are: TRANSMITTAL. INJURIOUS INSECTS, etc.: Ants on Fruit-Trees. *Derostenus* sp? Operations against the Gypsy-Moth in Massachusetts. *Gortyna immanis*, the Hop Vine Grub. *Gortyna cataphracta*, as a Raspberry-cane borer. Collections in the Adirondack Mountains in 1893. *Sitotroga cerealella*, the Grain-Moth. *Diplosis pyrivora*, the Pear-Midge. Notes on *Sciara*. *Sciara coprophila*, the Manure-Fly. *Sciara caldaria*, the Greenhouse *Sciara*. *Phora agarici*,

the Mushroom Phora. *Agrilus ruficollis*, the Gouty-Gall Beetle. *Anomala lucicola*, the Light-loving Grapevine Beetle. *Anomala marginata*, the Margined *Anomala*. *Diabrotica vittata*, the Striped Cucumber Beetle. *Dibolia borealis*, a Plantain-Leaf Miner. *Otiorhynchus ovatus*, the Ovate Snout-Beetle. *Conotrachelus cratægi*, the Quince Curculio. The Seventeen-Year Locust in the State of New York in 1894. *Psylla pyricola*, the Pear-Tree *Psylla*. Remarkable abundance of Aphides or Plant-Lice in 1893. Are Aphides Eaten by Spiders? *Pentatoma juniperina*, the Juniper Plant-Bug. *Leptocoris trivittatus*, the Box-elder Plant-Bug. The Grasshopper Plague in Western New York. *Julus cæruleocinctus*, with Associated Potato-Scab. Mites Attacking Mushrooms. Mites Infesting Potatoes. *Tyroglyphus Lintneri*, a Mushroom-Infesting Mite. *Phytoptus pyri*, the Pear-Leaf Blister-Mite. APPENDIX. (A) THE SCORPION-FLIES; *PANORPA RUFESCENS*; *BITTACUS STRIGOSUS*. (B) LIST OF DATES OF COLLECTIONS OF LEPIDOPTERA (HETEROCERA). (C) LIST OF PUBLICATIONS OF THE ENTOMOLOGIST. (D) ENTOMOLOGICAL PUBLICATIONS OF J. A. LINTNER, 1862-1869. (E) CONTRIBUTIONS TO THE DEPARTMENT IN 1893. (F) CONTRIBUTIONS TO THE DEPARTMENT IN 1894. (G) CLASSIFIED LIST OF INSECTS NOTICED IN REPORTS I-X. (H) ERRATA (ADDITIONAL) IN PRECEDING REPORTS. INDEX TO REPORTS I-X.

The Army Worm Invasion. (The Argus [Albany, N. Y.], for July 8, 1896, p. 8, c. 3—28 cm.; the same, in part, in New York Recorder, for July 15, 1896—18 cm.; Country Gentleman, for July 16, 1896, lxi, p. 552, c. 1—24 cm.; Rome Sentinel, for July 17, 1896—12 cm.; Circular of the Department of Agriculture of the State of New York.)

The army-worm appears in Washington County, N. Y., the first week in July, and in other localities near Albany, in immense numbers and quite injurious. Crushing them and ditching to arrest their progress is recommended, also spraying narrow strips in advance of their march with Paris green. Its injuries will soon cease. None of its parasites seen as yet.

[Extended in pages 190-214 of this Report (xii).]

Wire Worm. (Country Gentleman, for July 9, 1896, lxi, p. 540, cols. 1, 2-13 cm.)

Examples sent from Hackettstown, N. J., where they have been quite injurious to corn, are identified as wire-worms and their general characters given. No entirely effective remedy for them has been found. Kainit is said to be a remedy. Salt is of doubtful value. Plowing in the autumn and attracting to baits recommended.

The Army Worm Invasion. (New York Daily Tribune, for Saturday, July 18, 1896—57 cm.)

The presence of the army worm [*Leucania unipuncta*] in eastern New York. The caterpillars unusually abundant and destructive. Lime, plaster, rolling the ground, ditching, etc., recommended. No

parasites observed. Favoring meteorological conditions responsible for their immense numbers. Not likely to be so numerous another year.

[Extended in pages 190-214 of this Report (xii).]

Tent Caterpillar. (Country Gentleman, for July 23, 1896, lxi, p. 571, c. 4—5 cm.)

An example of a moth occurring in great numbers sent for identification from Baltimore, Md., was the apple-tree tent-caterpillar [*Clisiocampa Americana*]. Some particulars relating to the cocoon and the moth were given in reply.

The Army Worm. (Country Gentleman, for July 23, 1896, lxi, p. 574, cols. 3, 4—32 cm.)

The caterpillars were reported in the last week of June. The week following, many had nearly attained their growth and were destroying grains and grasses in most of the southeastern counties of the State. Ditching, rolling, spraying infested strips with Paris green, and applications of air-slacked lime, plaster, or even road dust, recommended. The most serious injury has already been committed. The moth, *Leucania unipuncta*, is not uncommon. The unusual abundance of the insect this year is due to meteorological conditions which may not prevail the coming year.

[Extended in pages 190-214 of this Report (xii).]

Cut-Worms and Borers. (Country Gentleman, for July 30, 1896, lxi, p. 591, cols. 1, 2—22 cm.)

In response to inquiry from Montclair, N. J., for remedies for cut-worms and borers it is stated that the feeding and other habits of cut-worms are so various that no one general remedy can be given. Fresh clover sprinkled with Paris green water and laid in loose bunches between the rows, or cabbage or turnip leaves treated in a similar manner, have been found quite effective. Bran mash poisoned with arsenic might be used in the same manner. Digging out the cut-worms is sure and not very laborious. The soft-soap carbolic acid wash poisoned with Paris green is recommended for borers. Common whitewash is believed to be a preventive by many.

More About the Army Worm. (Country Gentleman, for August 6, 1896, lxi, p. 606, cols. 1, 2—52 cm.)

The army worm [*Leucania unipuncta*], reported as injurious on many farms at Orchard Home, N. Y. Ditching was quite effective and it was found that plowing a furrow and returning in it, gave good results. Holes, 10 or 15 inches deep at intervals in the furrows, proved efficient. The wheat bran mash reported effective, the worms descending from the corn to eat it.

In reply, the precautions taken are commended, though deeper holes are preferable. The dead worms observed on the ground may have been killed by ground beetles, *Carabidæ*, or by parasitic flies

Nemoræa leucaniæ [*Winthemia 4-pustulata*]. When and where the eggs are laid and other items of life-history.

[Extended in pages 190-214 of this Report (xii).]

Snapping Bugs. (Country Gentleman, for August 6, 1896, lxi, p. 610, c. 1 — 12 cm.)

In response to an inquiry from Beaver Creek, Col., it is stated, that it has been found serviceable to attract click-beetles, or snapping-bugs to poisoned baits, from May to August inclusive. The exact time for continuance of the baits to be ascertained by the number of beetles drawn to them. Freshly cut clover, dipped in Paris green water, is perhaps, the best bait. A corn or bran mash sweetened with sugar and containing arsenic should be effective.

Blister Beetles. (Country Gentleman, for August 13, 1896, lxi, p. 624, c. 3 — 12 cm.)

Insects sent from Madison, N. J., where they had been feeding on beets and mangels, are of two species. The black one, with a narrow ash-colored margin on the wing covers, is the "margined blister beetle," *Epicauta cinerea* (Forst.), a common and destructive species at times, feeding on potato and tomato leaves; seldom continuing longer than a week. The other, "the striped blister-beetle," *Epicauta vittata* (Fabr.), is especially destructive to potatoes and is a more southern form. Lime or plaster of Paris are remedies. The larvæ of these beetles, destroy grasshopper eggs and are therefore beneficial.

Willow Butterfly. (Country Gentleman, for August 27, 1896, lxi, p. 666, cols. 1, 2 — 10 cm.)

Caterpillars, identified as *Vanessa Antiopa*, are stated to have ravaged trees on the bar [at Whitehall, N. Y.], next the Lake, to an extent that caused them to look as if dead. Their occurrence in such destructive numbers is quite unusual.

Caterpillars and Parasites. (Country Gentleman, for August 27, 1896, lxi, p. 670, cols. 1, 2 — 21 cm.)

A half-grown larva of *Ampelophaga Myron* (Cramer), from a woodbine at Port Kent, N. Y., is nearly covered with the cocoons of its common parasite, *Apanteles congregatus*. The history of the parasite is given, and also of a secondary parasitic attack by a Chalcid on *Apanteles*.

The Oak Pruner. (Country Gentleman, for September 3, 1896, lxi, p. 682, c. 4 — 6 cm.)

The small limbs of some hard maple trees at Baltimore, Md., are cut off by some insect, as clean, as though with a knife. The attack is identified, as, in all probability, that of the oak pruner, *Elaphidion parallelum* Newm. The insect may be kept in check by collecting the fallen branches and burning them.

The Beech-Tree Blight. (Country Gentleman, for September 10, 1896, lxi, p. 705, c. 4—26 cm.)

Beech leaves from Scarsdale, N. Y., are thickly infested with *Schizoneura imbricator* (Fitch). The enveloping white substance is noticed, and the honey-dew which it secretes. As the insect is difficult to reach with insecticides, crushing the collected masses is recommended.

Elm-Tree Borer. (Country Gentleman, for September 24, 1896, lxi, p. 746, c. 1—14 cm.)

A borer, infesting elm-trees in Peoria, Ill., is identified from the account given of it, as the elm-tree borer, *Saperda tridentata* Olivier. The best remedies for it are these: 1. Removing the dead bark over the infested portion until the insects are reached, and applying kerosene emulsion to kill them. 2. Preventing egg-laying by coating the portion of the trunk threatened with a repellant coating in which Paris green and carbolic acid are mixed.

[Extended in pp. 243-248 of this Report (xii).]

The Cecropia Moth. (Country Gentleman, for September 24, 1896, lxi, p. 746, c. 2—9 cm.)

A supposed vegetable growth on a grapevine, from Auburn, N. Y., is the cocoon of *Attacus Cecropia*. Features of the cocoon are given from which it may be recognized.

Imported Scale Insects. (Country Gentleman, for September 24, 1896, lxi, p. 746, c. 3—13 cm.)

In commenting on a statement of the recent arrival at Seattle, Wash., of a steamship from Japan, with some Japanese plants badly infested with a destructive scale-insect, the importance is urged of such quarantine regulations at that port as shall prevent the introduction of the scale insects of Japan, and also at other of our ports where plants and fruits are largely imported. The particular scale referred to above, *Diaspis lanatus*, has been in the United States for at least four years, having probably been introduced from the West Indian Islands, and is now in Florida, Georgia, and District of Columbia on peach trees. How destructive it may prove, remains to be seen.

Pea Bugs. (Country Gentleman, for October 1, 1896, lxi, p. 763, cols. 3, 4—12 cm.)

In reply to inquiry from Baiting Hollow, L. I., the life-history of the pea-weevil, *Bruchus pisorum* is given, and for killing the insect, chloroform or bisulphide of carbon are recommended.

Rose-Leaf Hopper. (Country Gentleman, for October 1, 1896, lxi, p. 763, c. 4—10 cm.)

A remedy is asked for from Port Kent, N. Y., for "a small white fly infesting rose-bushes." It is probably "the rose-leaf hopper," *Typhlo-*

cyba rosa (Harris), and for destroying it, the following are recommended: whale-oil soap, tobacco water (made after formula given), pyrethrum powder mixed with flour, and a strong stream from a garden hose of cold water. The last, if used on the young larvæ, is a simple and effective remedy.

The Wheat Wire Worm. (Country Gentleman, for October 22, 1896, lxi, p. 826, c. 1—21 cm.)

Agriotes mancus (Say) was received from Torresdale, Pa., as having ruined potato crops. Features of wire-worms; the difficulty in dealing with them, and their life-period. Kainit or other potash salts are recommended for their destruction, also baits of poisoned clover for the beetles, and late plowing for crushing the pupæ.

Apple-Tree Borers. (Country Gentleman, for December 10, 1896, lxi, p. 949, cols. 2, 3—36 cm.)

The borers that are infesting old trees which always drop their fruit before ripening, in Pittsburg, Pa., are probably the round-headed and flat-headed borers, *Saperda candida* Fabr. and *Chrysobothris femorata* (Fabr.). The trees may possibly be saved by proper fertilizers and prevention of further attack. A soft soap and carbolic acid wash applied the last of May and renewed whenever needed, is a good preventive of egg deposit. The "Saunders Wash" of soft soap and washing soda, is highly esteemed in Canada. "Dendrolene" may not as yet be recommended for general use. Remedies, are cutting out or crushing the borers after the methods stated. For protection of young trees wrap bands of cloth or folds of newspaper around the base of the trees for a foot or more.

Notes on Some of the Insects of the Year in the State of New York. (Bulletin 6, New Ser., Divis. Entomol., U. S. Dept. Agricul., 1896 pp. 54-61.)

The year has been characterized by the unusual harmlessness of a number of common insect pests, and the remarkable scarcity of insect life with a few exceptions. Notes on the following insects are given: *Leucania unipuncta*, *Leucania albilinea*, *Anisopteryx vernata*, *Cacæcia rosaceana*, *Nolophana malana*, Cecidomyiid larva on choke-cherry, *Euphoria Inda*, *Elaphidion villosus*, *Crioceris asparagi*, *Macrobasis unicolor*, Chinch-bug, *Aspidiotus perniciosus*, *Kermes galliformis*, and *Gossyparia ulmi*.

[See pages 307-318 of this Report (xii).]

Eleventh Report on the Injurious and Other Insects of the State of New York for the Year 1895. Albany, 1896. [Issued January 21, 1897.] Pages 238, plates 16, figures 25. (Forty-ninth Report on the New York State Museum, for the Year 1895. Albany, 1897 [issued in October, 1897], pp. 245, plates 16, figures 25.)

The contents are: INTRODUCTORY. INJURIOUS INSECTS: Monomorium Pharaonis, the Little Red Ant. Ants in a Lawn. On

Arsenical Spraying of Fruit Trees while in Blossom. On the Girdling or Elm Twigs by *Orgyia leucostigma*. *Eudiotis nitidalis*, the Pickle Caterpillar. *Eudiotis hyalinata*, the Melon Caterpillar. *Pyrausta futilalis*, a Dogbane Caterpillar. *Mecyna reversalis*, the Genista Caterpillar. *Pylalis costalis*, the Clover-Hay Caterpillar. *Grapholitha interstinctana*, the Clover-seed Caterpillar. *Antispila nyssæfoliella*, the Sour Gum-tree Case-Cutter. *Tischeria malifoliella*, the Apple Leaf Miner. *Cecidomyia betulæ*, the Birch-tree Midge. *Diplosis cucumeris*, the Melon-vine Midge. *Diplosis setigera*, the Hairy Melon-vine Midge. *Anthomyia* sp., ? the Raspberry-cane Maggot. *Anthrenus scrophulariæ*, the Carpet-Beetle. *Pyrophorus noctilucus*, the Cucuyo. *Crioceris asparagi*, the Asparagus Beetle. *Lina scripta*, the Cottonwood-leaf Beetle. *Galerucella luteola*, the Elm-leaf Beetle in Albany. *Galerucella cavicollis*, a Cherry-leaf Beetle. *Blissus leucopterus*, the Chinch-bug. The San José Scale [*Aspidiotus perniciosus*], and Other Destructive Scale Insects of New York. *Myrmeleon* sp. ?, the Ant Lion. *Thrips tabaci*, the Onion Thrips. *Schoturus nivicola*, the Snow Flea. *Achorutes diversiceps*. *Tyroglyphus heteromorphus*, a Carnation Mite. APPENDIX. (A) LIST OF INJURIOUS APPLE-TREE INSECTS. (B) LIST OF PUBLICATIONS OF THE ENTOMOLOGIST. (C) CONTRIBUTIONS TO THE DEPARTMENT IN 1895. (D) CLASSIFIED LIST OF INSECTS, ETC., NOTICED IN THIS REPORT. (E) EXPLANATIONS OF PLATES. INDEX.

(D)

CONTRIBUTIONS TO THE DEPARTMENT IN 1896.

HYMENOPTERA.

Saw-fly larvæ, *Hylotoma pectoralis* Leach, feeding on birch, August 12th. From Mrs. H. D. GRAVES, Ausable Forks, N. Y.

Larvæ of the pear-tree slug, *Eriocampa cerasi* (Peck), August 18th. From R. W. STRICKLAND, Albion, N. Y.

Larvæ of the willow apple gall saw-fly, *Pontania pomum* (Walsh), from Delmar, N. Y., August 19th. From Prof. C. H. PECK, Menands, N. Y.

Tenthredo rufospectus (Norton), imago, May 25th from currant twig. From THOMAS TUPPER, Corning, N. Y.

The lunated long-sting, *Thalessa lunator* (Fabr.), June 4th. From FRANK UNGER, Albany, N. Y.

Bracon sp. From Mrs. E. C. ANTHONY, Gouverneur, N. Y.

A Chalcid, *Brucophagus* sp., from the fungus *Peridermium cerebrum* on *Pinus teda* from Auburn, Ala. From Prof. C. H. PECK, Menands, N. Y.

The large digger-wasp, *Sphæcius speciosus* (Drury), from a lawn, August 16th. From JAMES REYNOLDS, Poughkeepsie, N. Y.

A leaf-cutter bee, *Megachile montivaga* Cress.; *Pelopæus cæmentarius* (Drury), *Chalybion ceruleum* (Drury), and *Trypoxylon politum* Say. From Mrs E. B. SMITH, Coeymans, N. Y.

LEPIDOPTERA.

Larvæ of *Vanessa Antiopa* (Linn.), devastating willows, June 11th. From C. T. HAWLEY, JR., Cambridge, N. Y.

Larva of *Thyreus Abbotii* Swainson, July 7th; larva of *Deilephila chamænerii* Harris, var., from *Ænothera biennis*, October 20th. From Mrs E. B. SMITH, Coeymans, N. Y.

Larva of *Ampelophaga Myron* (Cramer), parasitized by *Apanteles congregatus*, and these, in turn, by a Chalcid, August 16th. From Mrs. D. D. KELLOG, Port Keat, N. Y. The same, in the same double parasitism, August 22d, from Mrs. E. C. ANTHONY, Gouverneur, N. Y.

Larva of *Ceratonia Amyntor* (Hübner), August 21st. From F. J. RIGGS, Albany, N. Y.

Hypoprepia fucosa Hübn., August 8th. From Mrs. K. E. TURNBULL, Tannersville, N. Y.

Larvæ (10) of *Empretia stimulea* Clemens, August 7th, on a leaf of garden cherry. From Dr. S. A. RUSSELL, Poughkeepsie, N. Y. The same, 7 examples on cherry, August 31st, from J. F. ROBINSON, Middletown, N. Y.

Egg-belt of *Clisiocampa Americana* Harris, June 17th, of the present year. From J. S. WHITCOMB, West Somerset, N. Y.

The leopard moth, *Zeuzera pyrina* (Fabr.), June 5th. From A. H. STRATTON, Arlington, N. J.

Eacles imperialis (Drury). From Mrs. E. C. ANTHONY, Gouverneur, N. Y.

Harrisimemna trisignata Walker, and *Agrotis subgothica* Haworth, Sept. 30th. From Mrs. E. B. SMITH, Coeymans, N. Y.

The army-worm, *Leucania unipuncta* (Haworth), July 1st, from J. N. MCHARG, Albany, N. Y. The same, July 2d, from S. E. SPALDING, Cambridge, N. Y. The same, July 6th, taken at Wemple, N. Y., from Hon. J. S. BAILEY, Albany, N. Y. The same, September 25th and October 2d, from H. S. AMBLER, Chatham, N. Y.

Xylina Bethunei Gr.-Rob., Sept. 30th. From Mrs. E. B. SMITH, Coeymans, N. Y.

Young apples eaten into by the larvæ of *Cacæcia rosaceana* (Harris), with examples of the larvæ, May 27th. From W. A. LAFLE, Albion, N. Y.

Examples of the currant span-worm, *Eufitchia ribearia* (Fitch), feeding destructively on gooseberries, June 5th. From LYMAN H. HOYRADT, Pine Plains, N. Y.

The spring canker-worm, *Anisopteryx vernata* (Peck), May 21st. From E. J. PRESTON, Amenia, N. Y.

Ephestia interpunctella Zeller, the larvæ in samp, split peas, "wheat germ meal and wheatlet," September 4th. From MELVIL DEWEY, Albany, N. Y.

Pears infested with the apple-worm, *Carpocapsa pomonella* (Linn.). From Prof. C. H. PECK, Albany, N. Y.

The apple-tree case-bearer *Coleophora Fletcherella* Fernald; the apple-leaf Bucculatrix, *Bucculatrix pomifoliella* Clemens, in the pupal stage on apple twigs, September 15th. From W. A. THACKER, Walcott, Wayne county, N. Y.

Larvæ of the willow-apple Tineid, *Batrachedra salicipomonella* Clemens, feeding within the galls of *Pontania pomum* (Walsh), August 19th, at Delmar, N. Y. From Prof. C. H. PECK, Albany, N. Y.

DIPTERA.

The dog-flea, *Pulex serraticeps* Gerv. FROM EARL S. CRANNEL, Albany, N. Y.

Larvæ of *Cecidomyia* sp. in galled choke-cherries, May 28th, from Bethlehem, N. Y. FROM PROF. C. H. PECK, Menands, N. Y.

The pear-midge, *Diplosis pyrivora* Riley. FROM DR. J. B. SMITH, New Brunswick, N. J.

Examples of *Sciara multisetata* Felt reared from mushrooms, *S. pauciseta* Felt from potatoes, and *S. fulvicauda* Felt from decaying blackberry roots; and of *Phora abidihalteris* Felt from mushrooms. FROM DR. J. B. SMITH, New Brunswick, N. J.

Chrysops sp. near *nigra*, *Scenopinus fenestralis* (Linn.), and *Pollenia rudis* (Fabr.). FROM MRS. E. B. SMITH, Coeymans, N. Y.

Larvæ of *Anthomyia* sp., mining beet leaves, June 16th. FROM C. W. SEELYE, Rochester, N. Y.

Larvæ and pupa of *Meromyza Americana* Fitch, from stalks of wheat, quite destructive in Altdorf, Wisc., June 24th. FROM E. S. GOFF, Madison, Wisc.

Larvæ of a Phorid (?), infesting, in association with coleopterous larvæ, the fungus, *Clitocybe illudens*, October 1st; also, numerous dipterous larvæ and imagoes from mushrooms, Sept. 29th. FROM C. H. PECK, Menands, N. Y.

COLEOPTERA.

Calosoma scrutator (Fabr.), September 4th. FROM G. R. HOWELL, Albany, N. Y.

Calosoma calidum (Fabr.), *Silpha Surinamensis* (Fabr.), *Chalcophora Virginensis* (Drury), *Dicerca divaricata* Say, *Aphodius* sp., *Osmoderma scabra* (Beauv.), *Monohammus confusor* (Kirby). FROM MRS. E. C. ANTHONY, Gouverneur, N. Y.

Coccinella 9-notata Hübn., *Alaus oculatus* (Linn.), *Epicauta cinerea* (Forst.) FROM MRS. E. B. SMITH, Coeymans, N. Y.

The twice-stabbed lady-bird, *Chilocorus bivulnerus* Muls., from mountain ash, June 1st. FROM A. H. STRATTON, Arlington, N. J.

Silvanus Surinamensis (Linn.), in wheat flour, August 22d. FROM F. J. RIGGS, Albany, N. Y. The same in samp, split-peas, flour, raisins, and dried currants, from MELVIL DEWEY, Albany, N. Y. The same in "Cerealine," from F. J. RIGGS, Albany, N. Y.

Wireworms, *Elateridae*, from roots of corn. FROM C. W. SARGENT, Hackettstown, N. J.

The Pennsylvania soldier beetle, *Chauliognathus Pennsylvanicus* (DeGeer), Sept. 30th. From Mrs. E. B. SMITH, Coeymans, N. Y.
Tenebrioides Mauritanica (Linn), from Miss M. SEYMOUR, Albany, N. Y.

Living examples of the cucuyo *Pyrophorus noctilucus* (Linn), June 17th, from the Island of San Domingo, W. I. From Mrs. EDMUND H. SMITH, Albany, N. Y.

Amphicerus bicaudatus (Say), taken while boring into a species of "African tamarisk," May 25th. From V. H. LOWE, N. Y. Agricultural Experiment Station, Geneva, N. Y.

Lucanus dama Thunb., June 10th. From R. H. SHREVE, Albany, N. Y.

The rose-bug, *Macrodactylus subspinosus* (Fabr.), June 10th, on apple. From Mrs. M. B. WELCH, South Butler, N. Y.

Pelidnota punctata (Linn.). From F. J. RIGGS, Albany, N. Y.

Larvæ (10) of *Euphoria Inda* (Linn.), from chip manure. From Prof. C. H. PECK, Albany, N. Y. The same, imago, injuring pears September 9th. From JAMES HENDRICKS, Albany, N. Y.

Elaphidion parallellum Newm., June 2d, in apple branches. From J. A. HOUCK, Albany, N. Y. Pruned twigs of the same, of Norway maple (many) and of pig-nut hickory (one), August 23d. From GEORGE T. LYMAN, Bellport, Suffolk Co., N. Y.

The maple-tree borer, *Plagionotus speciosus* (Say), June 29th. From A. P. WILLIAMS, Mannsville, Jefferson Co., N. Y.

Crioceris asparagi (Linn.), in eggs, larvæ, and imagoes, June 2d. From A. P. CASE, Vernon, Oneida Co., N. Y.

Chlamys plicata (Fabr.), in eggs and larvæ, on hickory, May 23d. From W. R. WALTON, Middletown, N. Y.

Bruchus obtectus Say, February 14th. From G. M. PATTEN, Poughkeepsie, N. Y.

The ash-gray blister-beetle, *Macrobasis unicolor* (Kirby), June 19th, feeding on the honey locust. From M. T. Richardson, New York City. The same, from potatoes, June 25th, from ———, Factoryville, N. Y.

Tribolium confusum Duval and *Calandra granaria* (Linn.), August 18th, infesting graham flour. From F. J. RIGGS, Albany, N. Y.

Scolytus rugulosus Ratz. (7 examples), August 13th, boring into apple and peach trees. From Prof. C. H. PECK, Albany, N. Y.

HEMIPTERA.

The harlequin cabbage bug, *Murgantia histrionica* (Hahn.), from cauliflower, April 23d. From E. A. NATHURST, Tracy City, Tenn.

Lygus pratensis (Linn.), from potatoes, June 22d. From D. F. HARRIS, Adams, N. Y.

The four-lined leaf-bug, *Pezilocapsus lineatus* (Fabr.). From Miss L. F. CLARKE, Canandaigua, N. Y.

The dog-day Cicada, *Cicada tibicen* Linn., July 31st and August 18th. From P. J. RIGGS, Albany, N. Y.

Typhlocyba vitis (Harris), from grape, September 4th. From Prof. C. H. PECK, Albany, N. Y.

Pemphigus imbricator (Fitch), on beach, August 31st. From D. J. GARTH, Scarsdale, N. Y.

Gossyparia ulmi Geoff., June 4th. From J. B. WASHBURN, Albany Co., N. Y.

Kermes galliformis Riley, from scrub oak, containing in December, pupæ of *Euclemensia Bassettella* (Clemens). From W. R. WALTON, Middletown, N. Y.

Lecanium sp., thickly encrusting a maple twig, May 13th. From SELWYN A. RUSSELL, M. D., Poughkeepsie, N. Y.

Lecanium sp. on *Prunus Simoni*, May 26th. From LEWYLLÉN DEFREEST, DeFreestville, Rensselaer Co., N. Y.

The San José scale, *Aspidiotus perniciosus* Coms. on pear, from T. C. ROYCE, Middletown, N. Y. The same, Nov. 28th, on apple, from Dr. EDWARD MOORE, Loudonville, N. Y.

ORTHOPTERA.

The mole cricket, *Gryllotalpa borealis* (Burm.), Sept. 28th. From J. W. BAYER, Saratoga Springs, N. Y.

Ceuthophilus maculatus (Harris), *Cyrtophyllus concavus* (Harris), *Amblycorypha oblongifolia* (De Geer), and *Diapheromera femorata* (Say). From Mrs. E. B. SMITH, Coeymans, N. Y.

Chorthopaga viridifasciata (De Geer). From Mrs. E. C. ANTHONY, Gouverneur, N. Y.

Periplaneta Australasiæ (Fabr.). From ERNEST F. IRVIN, Sinclairville, N. Y.

Periplaneta orientalis (Linn.). From SILAS W. BURT, New York City.

NEUROPTERA.

Epiaschna heros (Fabr.), June 9th. From Mr. KING, Fort Edward, N. Y.

Gomphus adelphus Selys, Sept. 30th. From Mrs. E. B. SMITH, Coeymans, N. Y.

Numerous examples of a Psocid occurring in oat refuse, September 29th. From H. S. AMBLER, Chatham, N. Y.

MYRIAPODA.

? *Polydesmus falcatus* Lintn. infesting greenhouses, February 12th. From J. G. CAMPBELL, Kansas City, Mo.

Cermatia forceps Raf., June 10th, in the Capitol. From L. M. LEE, Albany, N. Y.

(E)

CLASSIFIED LIST OF INSECTS, ETC., NOTICED IN THIS REPORT.

HYMENOPTERA.

Tenthredo rufopectus (*Norton*), the red-breasted Tenthredo.
Tremex columba (*Linn.*), the pigeon Tremex.
Ophion purgatum *Say*, the purged Ophion.
Thalessa lunator (*Fabr.*), the lunate long-sting.
Apanteles militaris (*Walsh*), the military Apanteles.
Camponotus herculeaneus (*Linn.*), a large black ant.
Formica exsectoides *Forel*, an eastern mound-building red ant.
Formica obscuripes *Forel*, a western mound-building red ant.
Formica rufa *Linn.*, the European wood-ant.
Formica subsericea *Say*, the large black ant.

LEPIDOPTERA.

Ecpantheria scribonia (*Stoll*), the great white leopard-moth.
Datana integerrima *Gr.-Rob.*
Attacus Promethea (*Linn.*), the Promethea moth.
Leucania albilinea (*Hubn.*), the wheat-head army-worm.
Leucania unipuncta (*Haworth*), the army-worm.
Eufitchia ribearia (*Fitch*), the gooseberry span-worm.
Anisopteryx vernata (*Peck*), the spring canker-worm.
Oxyptilus periscelidactylus (*Fitch*), the gartered plume-moth.
Cacœcia rosaceana (*Harris*), the oblique-banded leaf-roller.
Proteoteras æsculana (*Riley*), a maple and buckeye twig-borer.
Steganoptycha Claypoliana (*Riley*), a new maple-tree insect.
Euclemensia Bassettella (*Clemens*), a parasite of Kermes.

DIPTERA.

Cecidomyia species in choke cherries.
Sciara fulvicauda *Felt*.
Sciara agraria *Felt*.

Sciara multiseta *Felt*.

Sciara pauciseta *Felt*.

Sciara prolifica *Felt*.

Culex species, mosquitoes.

Winthemia 4-pustulata (*Fabr.*), the red-tailed Tachina-fly.

Belvoisia unifasciata *Desv.*, the yellow-tailed Tachina-fly.

Piophila casei (*Linn.*), the cheese skipper: the ham skipper.

Phora albidihalteris *Felt*.

COLEOPTERA.

Calosoma calidum (*Fabr.*), the fiery ground-beetle.

Lebia grandis (*Hentz*), an enemy of the Colorado potato-beetle.

Euphoria Inda (*Linn.*), the Indian Cetonian.

Elaphidion villosum (*Fabr.*), the oak pruner.

Elaphidion parallelum *Newm.*, the maple-tree pruner.

Plagionotus speciosus (*Say*), the sugar maple borer.

Neoclytus erythrocephalus (*Fabr.*), an elm, hickory and locust borer.

Saperda tridentata *Olivier*, the elm borer.

Crioceris asparagi (*Linn.*), the asparagus beetle.

Crioceris 12-punctata (*Linn.*), the twelve-spotted asparagus beetle.

Galerucella luteola (*Müller*), the elm-leaf beetle.

Odontota dorsalis *Thunb.*, a locust leaf-miner.

Macrobasis unicolor (*Kirby*), the ash-gray blister beetle.

Balaninus rectus *Say*, the smaller chestnut-weevil.

Balaninus proboscideus (*Fabr.*), the larger chestnut-weevil.

HEMIPTERA.

Podisus spinosus (*Dallas*), the spined Podisus.

Metapodius femoratus (*Fabr.*), the thick-thighed Metapodius.

Blissus leucopterus (*Say*), the chinch-bug.

Cicada septendecim *Linn.*, the periodical Cicada.

Pemphigus rhois (*Fitch*), the sumac-gall aphid.

Gossyparia ulmi (*Geoff.*), the elm-tree bark-louse.

Kermes galliformis *Riley*, the oak Kermes.

Aspidiotus perniciosus *Comst.*, the San José scale.

NEUROPTERA.

Neuronina pardalis *Walker*, the spotted Neuronina.

ARACHNIDA.

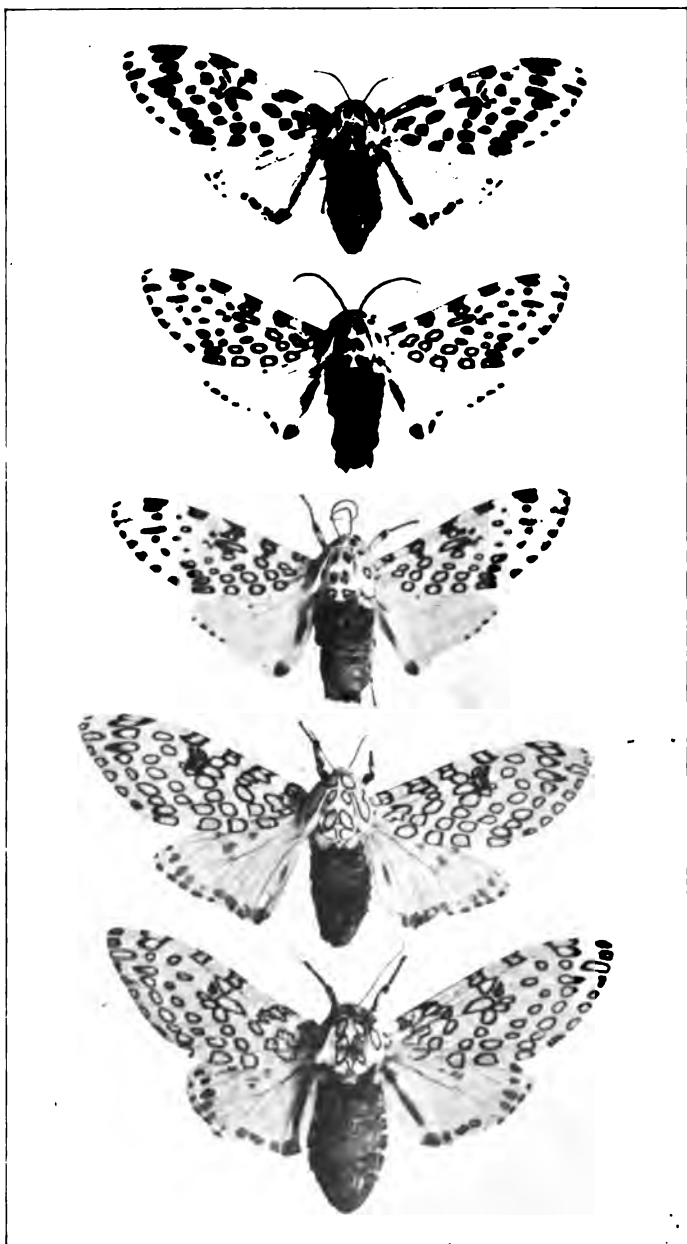
Phytoptus pruni Amerl., a Chickasaw plum mite.

MYRIAPODA.

Leptodesmus falcatus Linn., a thousand-legged worm in greenhouses.

Polydesmus complanatus (Linn.), the flattened millipede.

Polydesmus serratus Say, the serrate *Polydesmus*.



The Great White Leopard Moth.



Army-Worms at Work on Corn.





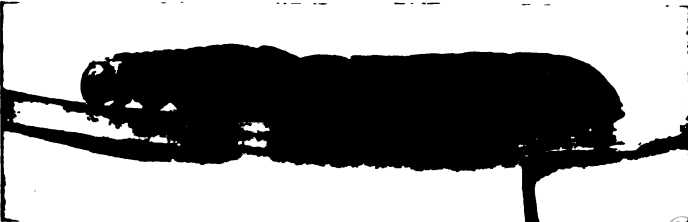
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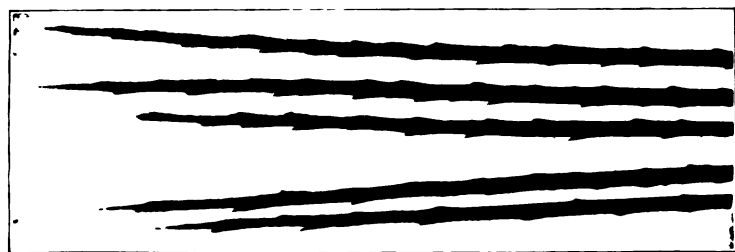
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Army-Worm Moths and Caterpillars.



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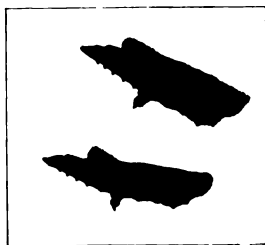
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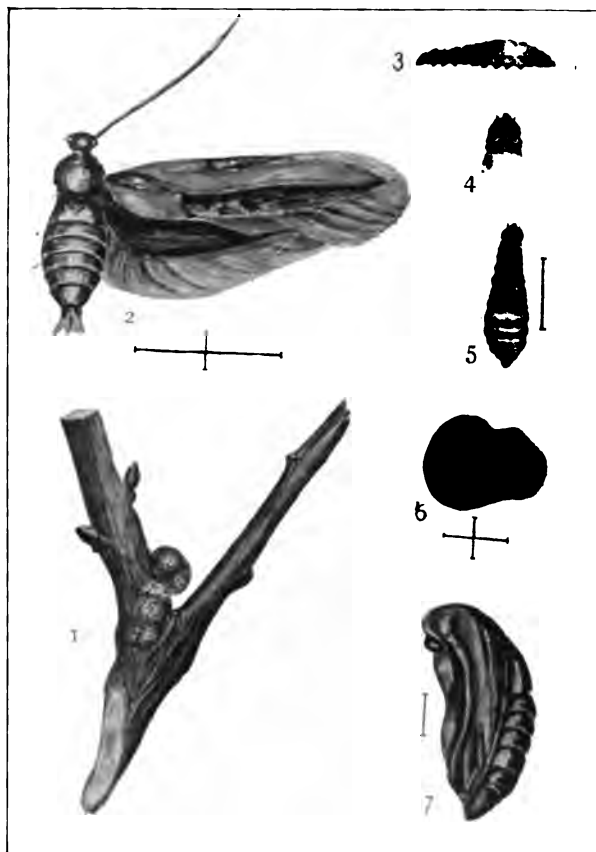
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Ecpantheria Spines — Grape-vine Plume-moth — Work of Army-worm.



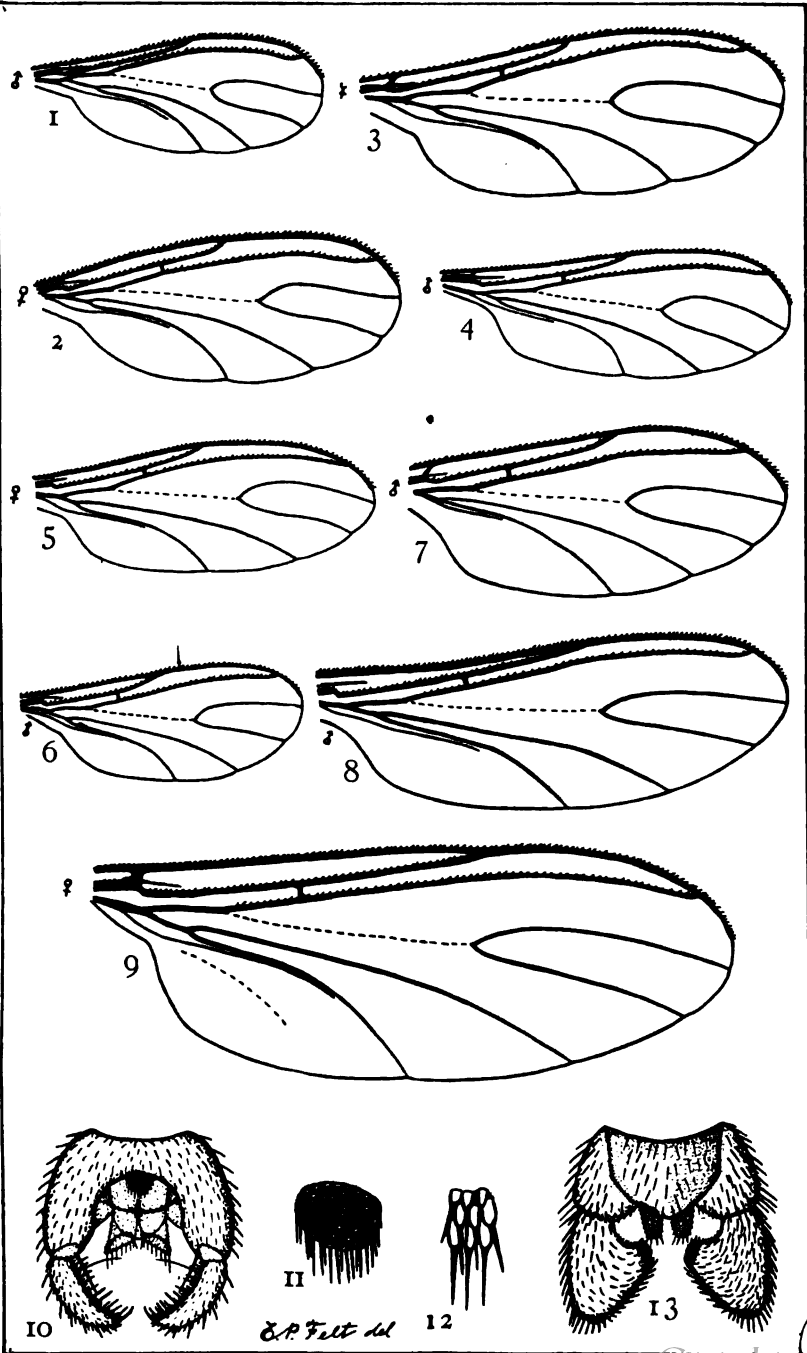


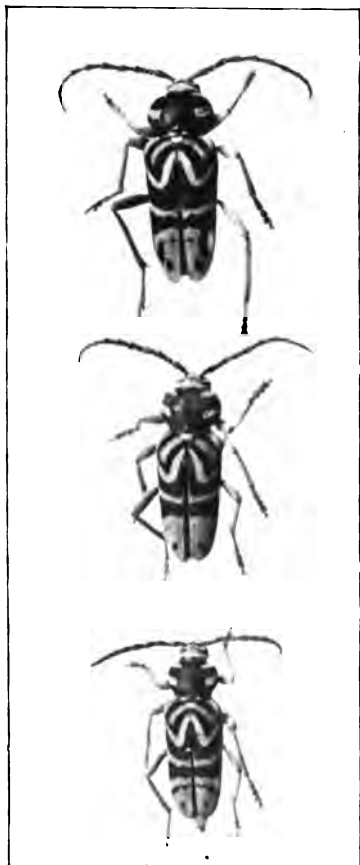
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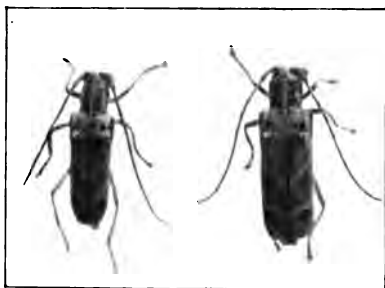
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Kermes — Euclemensia — Oxyptilus.

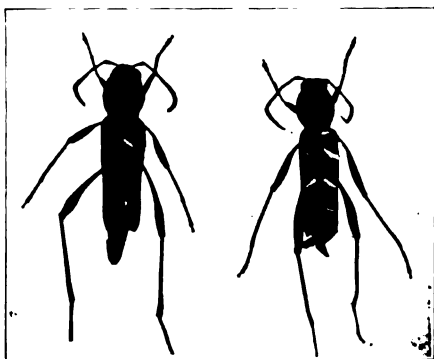




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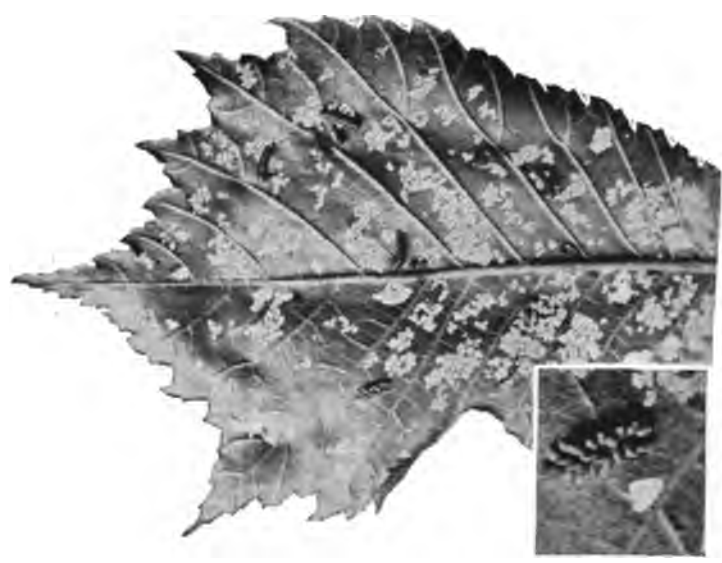
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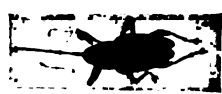
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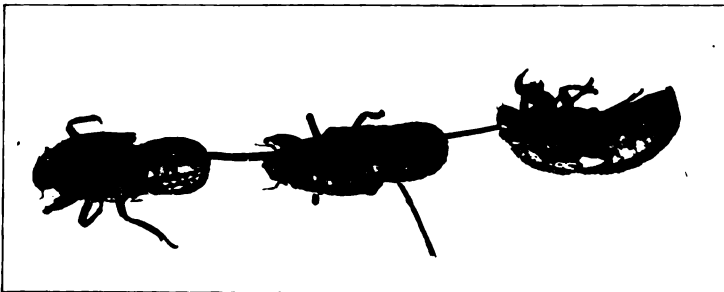


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Elm and Locust Leaf Beetles, and Chestnut Weevil.

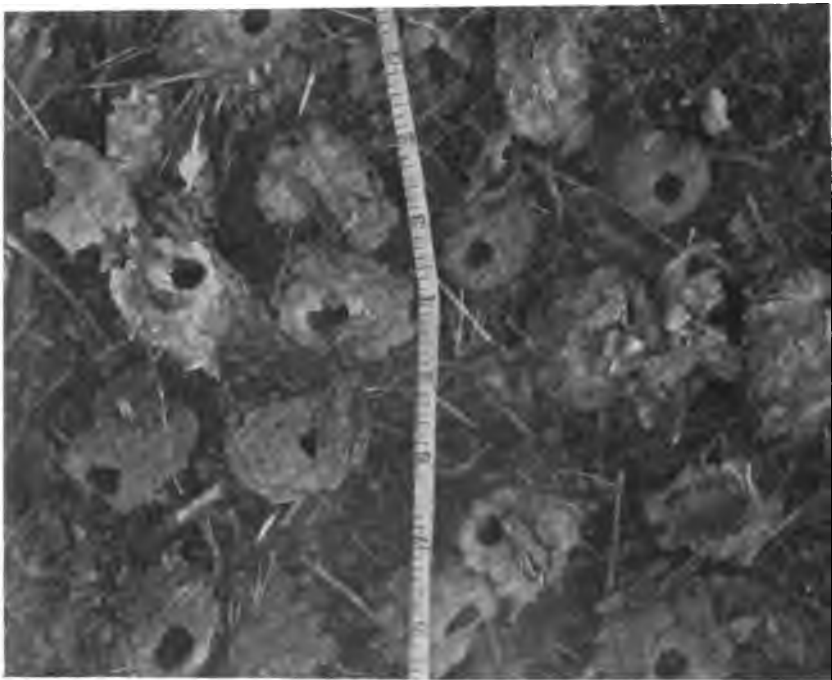


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The Seventeen-year Cicada.



Cicada Chambers, at New Baltimore, N. Y.



2



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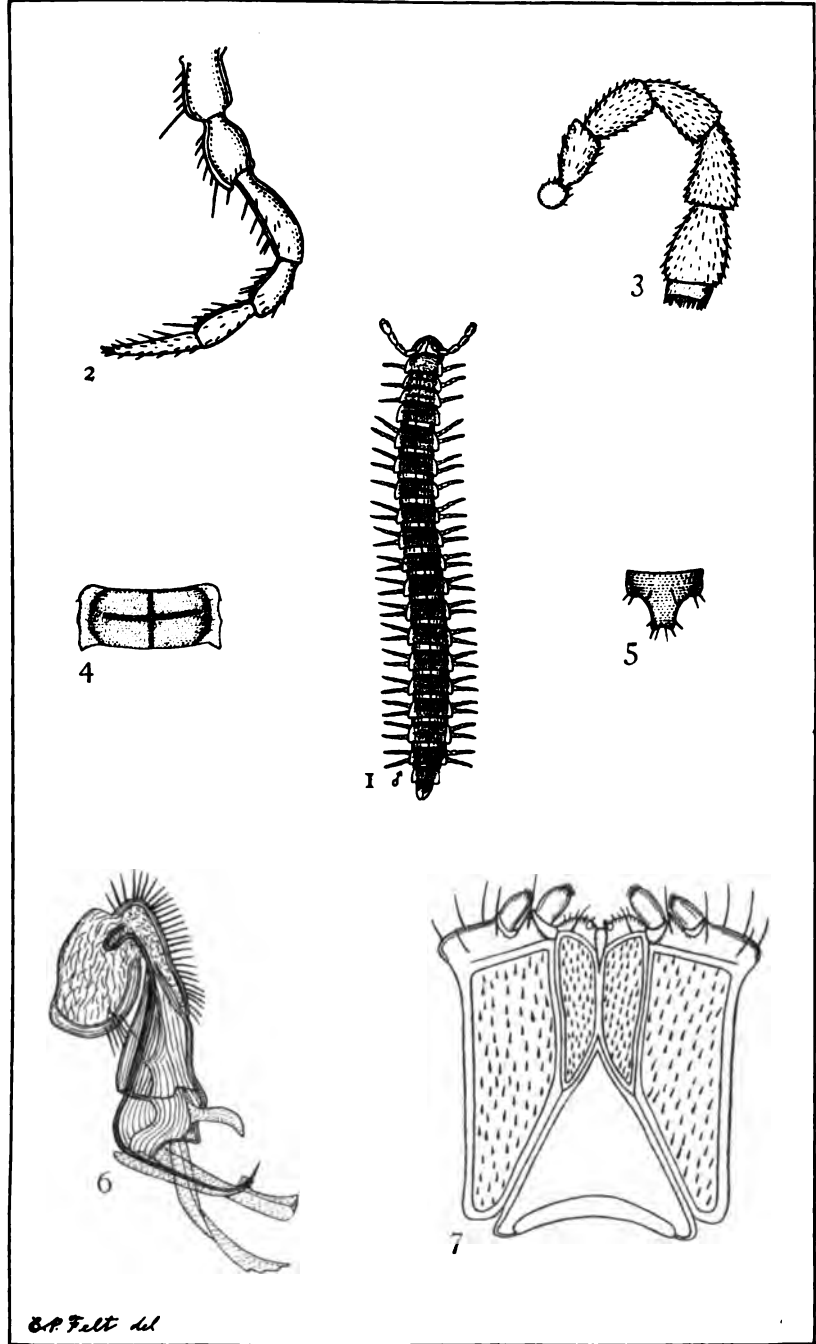
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B. P. Felt del

Leptodesmus.

(F)

EXPLANATION OF PLATES.

Plates I, IV, V, VII, VIII, IX, XIV, are from photographs by E. P. Felt. Plates X, XI, XII, XIII, are from photographs by W. W. Byington.

PLATE I.

Ecpantheria scribonia.

The Great White Leopard Moth.

The upper three figures are males; the lowest two, females: showing the variations in maculation in this species.

PLATE II.

Leucania unipuncta.

The Army-Worm

Army-worms at work on a corn plant, nearly natural size (after Slingerland).

PLATE III.

Leucania unipuncta.

The Army-Worm.

Fig. *a.*—Moth at rest, natural size; *b*, moth with wings expanded; *c*, moth twice natural size; lower figures, light and dark varieties of army-worms, twice natural size (after Slingerland).

PLATE IV.

Fig. 1 — Larval spines of *Ecpantheria scribonia*, thirty-five times natural size.

Fig. 2.—Heads of timothy eaten by army-worms, nearly natural size.

Fig. 3.—Tips of grape vines infested with larvæ of *Oxyptilus periscelidactylus*, natural size.

Fig. 4.—Young and nearly full-grown larvæ of *Oxyptilus*, about three times natural size.

Fig. 5.—Pupæ of same, about three times natural size

PLATE V.

- Fig. 1.— *Kermes galliformis* on twig, natural size.
 Fig. 2.— Imago of *Euclemensia Bassettella* (Clemens).
 Figs. 3, 4, 5.— Larvæ of same.
 Fig. 6.— Larva within the Kermes.
 Fig. 7.— Pupa (Figs. 1 to 7 from colored drawings by W. R. Walton).
 Fig. 8.— *Oxyptilus periscelidactylus*, twice natural size.
 Fig. 9.— The same in natural position, twice natural size.

PLATE VI.

- Fig. 1.— Wing of *Sciara multiseta*, male.
 Fig. 2.— “ “ “ female.
 Fig. 3.— “ *S. pauciseta*, female.
 Fig. 4.— “ “ “ male.
 Fig. 5.— “ *S. agraria*, female.
 Fig. 6.— “ “ “ male.
 Fig. 7.— “ *S. fulvicauda*, male.
 Fig. 8.— “ *S. prolifica*, male.
 Fig. 9.— “ “ “ female (Figs. 1 to 9 inclusive thirty-five times natural size).
 Fig. 10.— Genitalia, dorsal aspect, of *S. agraria* (enlarged).
 Fig. 11.— Group of setæ of *S. multiseta* (much enlarged).
 Fig. 12.— Group of setæ of *S. pauciseta* (much enlarged).
 Fig. 13.— Genitalia, dorsal aspect, of *S. fulvicauda* (enlarged).

PLATE VII.

- Fig. 1.— *Plagionotus speciosus*; the upper two females, natural size.
 Fig. 2.— *Saperda tridentata*, male and female, twice natural size.
 Fig. 3.— *Neoclytus erythrocephalus*, male and female, twice natural size.
 Fig. 4.— Work of *Saperda* and *Neoclytus* under the bark in elm, one-half natural size.
 Fig. 5.— Cross-section of limb showing work of *Saperda* and *Neoclytus*, one-half natural size.

PLATE VIII.

- Fig. 1.— Under surface of elm-leaf showing eggs, the larvæ and their work, of the elm-leaf beetle (nearly natural size); in the lower left-hand corner a group of eggs is represented three times natural size.
- Fig. 2.— Locust leaves skeletonized by *Odontota dorsalis*, nearly natural size.
- Fig. 3.— *Odontota dorsalis*, three times natural size.
- Fig. 4.— Lateral view of male and female chestnut weevil, *Balaninus rectus*, twice natural size.
- Fig. 5.— Chestnuts injured by weevil, one opened to show work inside, nearly natural size.
- Fig. 6.— Dorsal view of female chestnut weevil, *Balaninus rectus*, twice natural size.

PLATE IX.

Cicada septendecim.*The Seventeen-Year Cicada.*

- Fig. 1.— Male and female with wings spread (the left fore-shortened in photographing); one with wings closed, nearly natural size.
- Fig. 2.— Dorsal, lateral and ventral aspects of pupal shells, nearly natural size.

PLATE X.

Vertical views of Cicada chambers taken at New Baltimore, N. Y.; the lower one nearly one-half natural size, the upper one much reduced.

PLATE XI.

Cicada chambers collected at New Baltimore, nearly one-half natural size.

PLATE XII.

Cicada chambers at New Baltimore.

PLATE XIII.

Cicada chambers at New Baltimore, another view.

PLATE XIV.

- Fig. 1.— Galls of *Pemphigus rhois*, natural size.
- Fig. 2.— *Gossyparia ulmi*, full-grown females, taken June 7, slightly enlarged.
- Fig. 3.— Male cocoons of *Gossyparia*, three times natural size.
- Fig. 4.— Half-grown females of *Gossyparia*, taken Sept. 7, four times natural size.
- Fig. 5.— Full-grown females of *Gossyparia*, about three times natural size.

PLATE XV.

Leptodesmus falcatus.

- Fig. 1.— Male, three times natural size.
- Fig. 2.— Leg (x 24).
- Fig. 3.— Palpus (x 17).
- Fig. 4.— Dorsum of segment (x 7).
- Fig. 5.— Dorsum of terminal segment (x 7).
- Fig. 6.— Lateral view of copulatory leg of male (x 65).
- Fig. 7.— Gnathochilarium (x 35).

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ERRATA.

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- Page 197, line 3 from bottom, at end of line read : lying in.
Page 197, line 2 from bottom, for reportedon, read reported on.
Page 291, line 15, for Missouri read Illinois.
Page 308, line 10 from bottom, for current read currant.
Page 356, line 5 from bottom, for 238 read 243.
Page 357, line 9, for Birch-tree read Birch-seed.
Page 363, line 13, for beach read beech.
Page 363, line 15 from bottom, for FREEST read FREEST.

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ABORIGINAL CHIPPED STONE
IMPLEMENTS
OF
NEW YORK

PREPARED BY

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INTRODUCTION

In 1896, the legislature appropriated \$5000 to be used by the regents of the University for increasing the state collection illustrating New York aboriginal life, and for preserving such facts as might seem to them of most value. Most of this appropriation has been judiciously used by A. G. Richmond, esq., honorary curator of this department of the state museum, in securing several collections of great value. It was also thought advisable to issue some bulletins of a popular nature, illustrating the antiquities of New York, especially the implements and ornaments of the aborigines. In furtherance of this plan the Rev. W. M. Beauchamp, S. T. D., of Baldwinsville, N. Y., was consulted and his aid secured. He had been engaged for a quarter of a century, in this study, and had accumulated a vast amount of available material. His suggestion was that such work might be distributed under suitable heads, each subject complete in itself, but forming a series if desired. The first would be that of the chipped stone implements of New York, and a paper on this is subjoined. A second would be on those polished articles of stone, in which New York is so rich; the paper on this is nearly completed, and will be an important contribution to science. Others might treat on the articles of clay, bone, horn, shell and metal, so abundantly found in the state.

It was thought that, in this way, not only would clearer information be afforded, but that the state museum would be the gainer, by valuable contributions of many things altogether uncared for now. Such has been the result elsewhere, and the local pride of our citizens may confidently be relied upon to make the state collection one unsurpassed. The illustrations are selections from the thousands of drawings which Dr Beauchamp has made, and show both rare and common forms.

For this valuable bulletin the state is indebted solely to Dr Beauchamp to whom its publication has been wholly entrusted. For the admirable work done in increasing the archeological collection, the state is indebted to our honorary curator, A. G. Richmond, president of the Canajoharie national bank, who has for years given his

active and extremely valuable expert service to the increasing of our collections without a dollar of compensation from the state. It is a pleasure to recognize in this public way a service so satisfactory in its result and so unusual in being rendered to the state without salary.

It is hoped that Dr. Beauchamp may from the results of his work for the past 25 years give us a series of bulletins which will make his stores of special knowledge available to every student of the subject.

MELVIL DEWEY

Secretary of the University

ABORIGINAL CHIPPED STONE IMPLEMENTS OF
NEW YORK

ARCHEOLOGICAL WORK IN NEW YORK

While much has been done by the state of New York in the preservation and dissemination of documents relating to early days, little until now has been accomplished in collecting and arranging those still earlier records, found so largely in stone, which reveal much unwritten history. All early writers describe a condition of things evidently not representative of periods which were then already days of old. Implements and ornaments had changed, arts and history had been forgotten, a new race had displaced the old, as we have taken its place in turn. We can only know what that history and those arts were, by seeking their surviving memorials in the soil.

The state, however, has done valuable service in embodying so much relating to what is called indian history, in many of its publications. Crude as was Mr Schoolcraft's *Report on the Iroquois*, made in 1845, it was a boon to the public, and preserved or suggested much valuable matter. This was notably the case with the several Iroquois dialects, afterwards much enlarged by him. The *Documentary history* and the *New York colonial documents* made other interesting matter accessible. The *Report on the indian problem*, in 1889, wisely placed the Iroquois treaties before the public, although it was great misfortune that the signatures to these were not submitted to an expert in indian names. It would have saved a host of needless errors.

The work of the regents in the same direction has been good as far as it has gone. The annual reports which contain the papers of L. H. Morgan on recent Iroquois implements and ornaments, are yet among the most popular and best preserved. Part of these were afterwards embodied in his valuable *League of the Iroquois*, and were first produced nearly half a century since. The publication of Father Bruyas' Mohawk lexicon, written two centuries ago, was one of the earliest attempts to bring a New York indian language before the public, when systematically arranged. It has since been fully translated. The publication of the explorations and plans of Messrs Hough and Cheney, in the northern and western parts of New York gave prominence to the interesting earthworks in both sections, with occasional notes from others.

In connection with Mr Morgan's literary work he made an interesting collection of modern Iroquois articles for the state museum, and this has been partially supplemented by that made for the World's fair at Chicago, by the Rev. J. A. Sanborn. These might be enlarged. Occasional stone and other relics have come into the state collection by donation, but no systematic or sustained work has been done until that now begun. Individuals have not been idle in making up their own cabinets, sometimes soon dispersed, sometimes remaining, but often far surpassing anything belonging to the state. Notable among these are the collections of O. M. Bigelow, in Baldwinsville, illustrating Onondaga and neighboring counties; that of J. S. Twining, Copenhagen, pertaining to Jefferson county, now in the possession of the state; and those of S. L. Frey, Palatine Bridge, and A. G. Richmond, Canajoharie, so rich in the relics of Montgomery county and vicinity. Many smaller collections of interest might be mentioned.

The early Dutch writers are now available in many ways, and the various historical societies have added much to our knowledge of the aborigines. The Pennsylvania archives and colonial records contain much relating to those of this state, and other valuable material will be found outside of our limits. The recently discovered journal of Arent Van Curler (Corlaer) is a treasure indeed. The *Jesuit relations* have been diligently culled and annotated, and large portions relating to New York are now within easy reach. Valuable notes on local antiquities may be found in such works as Bolton's *History of Westchester*, Hough's *Histories of Jefferson and St Lawrence counties*, Doty's *History of Livingston county*, Young's *History of Chautauqua*, the *Onondaga centennial*, Clark's *Onondaga*, and many other local histories. Some are carefully prepared, forming a good working foundation.

The work done by Mr Squier as yet stands alone as a general account of the antiquities of New York now accessible to the public. Dr Frederick Larkin published a little work in 1880, entitled *Ancient man in America*, which is a careful treatise on the antiquities of the western part of the state. The Rev. W. M. Beauchamp prepared a map for the U. S. Bureau of ethnology, some years since, with de-

scriptive notes of the Iroquois portion of the state, much of it from personal field work. This has since been enriched, and now contains all the reported indian sites of New York, large and small. It is very suggestive in many ways. The Bureau of ethnology has done much here, although its larger fields in the west compel it to leave many things to local efforts.

Philology has had its students. The issuing of Father Bruyas' valuable Mohawk lexicon marked an era in this respect, and Mr J. G. Shea has made valuable contributions from early French publications since that time. Messrs L. H. Morgan and O. H. Marshall did excellent work on the indian names in the western and some other parts of the state. Mr W. W. Tooker in the eastern, and the Rev. Dr Beauchamp in the central part of New York have done much in the same line. Prof. Horsford published Zeisberger's *Onondaga and Delaware dictionary* in 1887, but his journal of his residence at Onondaga still sleeps in the old manuscript at Bethlehem. The late Horatio Hale's *Iroquois book of rites* is an invaluable contribution to our knowledge of Iroquois songs and ceremonies. Prof. Lyman, of Syracuse, has recently taken down a large collection of indian songs, with the accompanying music, and the Bureau of ethnology is steadily at work on the Iroquois dialects. Others might be mentioned.

Colden preserved much in his history of the Five Nations, and the quaint and marvelous history written by David Cusick, the Tuscarora, has passed through many editions. It has recently been republished, with ample notes. Morgan's *League of the Iroquois* is a standard work, but has little to do with prehistoric, or even early historic times.

ABORIGINAL OCCUPATION

The aboriginal occupation of New York was of a varied character and for a long time after it was first visited by man, almost its whole extent was but a temporary resort for hunters and fishermen. Rivers were the first places to attract men, and rifts on these were the favorite spots for camps. Good fishing and fording were important considerations and determined the routes of travelers and the location of many hamlets. The mere abundance of fish and game drew roving

men to some places, and the small supply of the former was a sufficient reason why the Mohawk valley was so little visited until a recent day. For a similar reason deep lakes were little frequented here, unless at the shallow waters near their outlets. The aborigines of New York seldom used the hook and line until after European contact, and the harpoon, arrow, stone fish weir and net were useful only where the water was of no great depth. Large lakes, too, were often perilous places for canoes, while on most rivers they could be employed at any time. Accordingly early relics and camps are most frequent near large streams and small lakes. Where a river was as large as the Hudson in its lower course, camps would be expected only near the mouths of its tributaries, or in sheltered spots; near the sea they would also occur on shallow bays. In the one case the burnt earth and frequent relics, in the other the great shell heaps attest the presence of early man.

Many of the finest articles, however, have been discovered near the old trails, or in low grounds. If lost on a village site in peaceful times, they would have been sought and found with comparative ease. On the road, time could not always be allowed for this, and weeds, brambles and mire might have rendered all search useless.

These visitors came from many directions, and with differing habits, as relics plainly show; but having once been here, there were soon favorite places of resort. In process of time small hamlets were formed, often but the renewal of fishing camps from year to year. The old lodges would be repaired or rebuilt on the same spots, used in the summer and abandoned in the winter. This was the Iroquois practice in the seventeenth century, and in Canada the wandering tribes had a succession of camping places, to which they periodically resorted. Some northern tribes were thus winter visitors in New York. Nearer the sea, many indian tribes as steadily vibrated between the shore and the interior as some of our people do now. The new is ever the old.

When the Iroquois came into New York they brought a change. They hunted and fished, but they were also growers of corn, pumpkins and beans. Although they camped on the rivers, their towns and forts were almost always at some distance from them. It might

be but a few rods, but often it was many miles. They wished not only strong positions, but situations where canoes could not reach them. This was always the case in warlike times, and the position of the town will often show confidence or fear. Their permanent homes also depended to some extent upon the soil, being a corn raising people; and in fact nearly all camps of others as well were placed on a light, and not a heavy soil. Very rarely indeed did other considerations outweigh this. Iroquois villages are thus not to be expected in regions characterized by primitive rocks; a glance at a map showing the indian sites of New York and Canada, will make apparent how much their location was affected by geological conditions.

The Algonquin tribes built palisaded forts in the eastern part of New York, somewhat like those of the Iroquois, and their long houses are reported to have been even longer than those of the latter. Earthworks here, however, were nearly all defenses of the Iroquoian family, and yield abundant earthenware. Some of these are quite recent, and in these are observed suggestions of a knowledge of European articles, soon followed by the articles themselves. These later sites, usually simple stockades, have often done a work similar to that of the Rosetta stone, but in another way. Knowing their age, and finding aboriginal relics on them of peculiar kinds, we are able to give the approximate age of similar articles elsewhere. In this will be found one great advantage of studying some New York sites, an advantage not confined in its results to our own borders.

One important question relates to the Eskimo. It will appear that some articles now used only by them are frequent in the northern part of New York, along with others which suggest their occasional presence. It is well known, also, that they once lived much farther south than now, and it may yet appear that they were sometimes visitors here. Rash conclusions are to be avoided, but so much is known as to call for further light.

It is to be deplored that such quantities of our finest relics are forever lost to the state, but this is a lament in which every part of our land shares. Enough remains to give us some idea of the arts — perhaps of the habits and history — of our predecessors. Although so

many forts and sites have also been obliterated, quite a goodly number have been located and described, and with a moderate farther research it is possible to tell a great deal of the occupation of New York in historic and prehistoric times.

The articles left by the aborigines here have a wide range in nature and origin. In a broad way they may be classed as flaked or chipped forms of stone, those of clay, those of shell, horn or bone, those of metal, glass and wood; and most interesting of all, those of picked or polished stone. This is a simple matter of convenience, for many things in all these have other relations. Fine and beautifully wrought articles may precede those which are rude, or they may have coexisted in the same camp or town. Horn and bone were often used with stone. Metallic articles were of a remote date, as well as recent. Wood was used in every period.

While many rude implements closely resemble those called paleolithic, these are usually surface finds here, pointing to no remote antiquity. In fact quite deep burial often proves no test of age, owing to some well known customs as well as natural agencies. Some implements made of argillite, and much changed by weathering or contact with the soil, although surface finds, are precisely like those occurring in the higher deposits at Trenton, N. J. Thus far none of the ruder articles have been reported at any great depth here, though this is but negative testimony, which farther research may change. Up to the present time polished stone implements have been reported here deepest of all. How reliable the reports are it is difficult to say.

Caches of flint are frequent, commonly composed of broadly chipped stones, rather more triangular than leaf-shaped in form, and nearly alike in size, although this is not always the case. In general they are supposed to be those from which others were to be made, having been deposited either for security or to preserve the temper of the flint. Although not strictly correct, this word will be used for a common material. Many of these simple articles were not farther elaborated, but at once came into use. Others may have been changed into other forms, but this is little more than theory. Their uniformity in size, and their burial in quantities give plausi-

bility to it, and it may well be allowed that they were brought from a distance for purposes of trade, or further development. Quantities of material came here in a still ruder form, which have not been found in caches, and among these were some of the choicer kinds. There are abundant flint flakes in places where they could only have come through the agency of man, and these indicate the arrow maker's temporary home.

The aborigines made but moderate use of the local hornstone, so plentiful in the corniferous limestone of New York, though it is often recognizable in the ruder articles to which it is adapted. At Black Rock in Buffalo, and across the river in Canada, one can easily see where blocks of hornstone were detached and used. Occasionally something of the kind will be seen elsewhere, but most of the material for the finer arrows, knives and spears came from without the state. Among these implements occur jaspers of every hue, white quartz, chalcedony, argillite, schist and sandstone, as well as the finer flints of bluish or brownish grey; yellow jasper was a favorite material, specially for large implements, and it is comparatively frequent in caches. It was probably derived from a neighboring state.

In a very broad way it is well known that the prevailing materials used in any region have a somewhat local character. Through Ohio and much of New York, the grey or drab cherts from the limestone are prevalent, with a projection of this material far southward. In the southern Atlantic states a brownish quartzite or coarse sandstone appears, with finer materials in the mountains. Along the Hudson and in New England white quartz was largely used; and in the northern states of the Mississippi valley an opaque white or pinkish flint was the rule. A characteristic dark hornstone also appears there in immense caches in some places. The beautiful arrows and other small implements of the Rocky mountains and the Pacific slope are also well known, and in other quarters yellow jasper is common. An experienced archeologist may thus often feel sure of the general origin of an article, without knowing precisely where it was found. That is a question of trade or migration.

Material is often a better guide in determining ultimate origin than form. The drills and scrapers of the east are often matched by

those of the west. A few New York arrows rival those of Oregon in size, though not in delicacy. When the stone used is considered the difference is more obvious. Form and material may both aid in determining what people visited New York in early days. In a representative and ample collection from this state, where the locality of the specimen is clearly and correctly recorded, as it always should be, later critical study of this kind may establish facts now unknown, regarding early migration and trade.

Celts, gouges and pestles were often made of local pebbles, but those of basalt and striped slate may show a different origin. Gorgets, tubes, ceremonial stones and amulets often do the same. Native copper implements of course come from afar, and sheets of mica do not naturally occur here. Steatite, as fragments of vessels, is also found abundantly, hundreds of miles from any quarry, and other like things will appear in due time.

All flint implements are not arrows or spears, however much they may resemble them at first sight, and thus a lack of observation and distinction has led to errors. It is not long since Sir John Lubbock said that there were no scrapers here, whereas many forms are abundant in New York alone, some of them precisely like those used by the Eskimo now. They simply had not been observed or reported. A very large proportion of implements termed arrows or spears are really knives. They never could have been shot or thrown with precision, they are so bent or one-sided. Many drills have also been called arrows; and in fact articles often grade into each other, or unite characteristic features. Drill, knife and scraper may appear in one implement, and a writer in early days said of western arrow points, 'if no knife is at hand, they use them also to skin the animals they have killed.' They would answer well.

While there are many gradations, or variations of form, in the flint implements found in New York, few typical examples have been found or described which are without representatives here, unless it be in some massive forms. Farther observation may supply these, and perhaps even others. On the other hand, some notable types appear here as yet undescribed. These should have due prominence.

In chipped or flaked implements the simplest form was that of the knife, which might sometimes be used for a spear, but not often for an arrow-head, unless of unusual symmetry. Many simple flakes were employed for this, the edge being sharply and neatly chipped. Some of these inconspicuous flakes show better workmanship in these edges than large and symmetrical implements, but they seem to have served only a temporary purpose. A knife was wanted; a flake was picked up, to which in a few moments an edge was given; it was used and thrown away. So that it was sharp, little more was required for mere use, but in many cases knives were both large and beautiful. As has been said, in an emergency almost any article might serve as a knife, but there are many special forms. When the surface was bent, as was often the case, knives were probably used also as scrapers, without having the distinct scraper edge. Some agree with Loskiel's description, who says, 'their knives were made in a long triangular shape, the long sides being sharpened.'

ARROW MAKING

In an excellent article on the stone art of the Mississippi valley, (13th *Annual report of the bureau of ethnology*, p. 139-42) Mr Gerard Fowke gives an extended account of arrow making, as practised in different places. Without going into full detail, it may be well to say here that chipping was usually done by pressure or percussion. In almost all cases, a piece of horn or bone, slightly notched, was used as a flaker. The process has been observed by many, for it is not an extinct art, although steel is now often substituted for horn or bone, and glass for stone. Any stone which will admit of a conchoidal fracture, and some which will not, may be used; for large implements, and even for small, a siliceous limestone or even sandstone was often employed. Quartz was used, but some varieties were not adapted for delicate work, while for large implements it was a showy material.

Usually the stone is held in one hand, or placed on wood, buckskin, a blanket, or other yielding substance. More rarely it is held against a stone anvil, and chipped with a stone hammer. Simple pressure suffices in most cases, the bone flaker being set against the

proper points, and small pieces being chipped off by pressing it in different directions. Some hold the stone in the hand, setting the tool at different points and angles, while an assistant gently strikes it. Pincers are sometimes used, and the Klamath indians hold the wooden handle of the flaker under the arm, pressing the stone against the point. A long flat tool, found in Great Britain, was thought a flaking implement by Mr Evans, but the same stone article is here either a scraper or knife.

The time required in arrow making differs according to the size or delicacy of the article to be made. In his account of the indians of Virginia, in 1607, Capt. John Smith said, 'His arrow-head he maketh quickly, with a little bone, of any splinter of stone or glass.' Evans said that the Mexicans could turn out a hundred obsidian knives in an hour, but these were probably only long and sharp flakes, often made at a single stroke. Crook, however, states that the indians of the plains will make from fifty to a hundred arrows in an hour, with a knife for a flaker. These must be rude, however serviceable. A Klamath indian made a complete arrow-head in five minutes, and a Shasta indian took an hour for this. On articles of extraordinary delicacy and size, many days might be employed.

Mr Frank H. Cushing, in his address upon the arrow, at the Springfield meeting of the American association for the advancement of science in 1895, gave an interesting account of his own experience in arrow making. In a boyish experiment he stumbled upon the use of the bone flaker, by which he at once chipped the flint 'in long, continuously narrow surface flakes wherever the edge was caught in the bone at a certain angle.' His experience proved to him 'that paleolithic man, of the French caves at least — that man who is said to have known no other art of working stone than by rudely breaking it into shape by blows of other stones — could not have existed in such primary status of art for more than a few seasons at most.' (See *Proc. A. A. A. S.* 1895. p. 205)

Before he went to the Smithsonian institution or to Zuni, he had elaborated 'some seven or eight totally distinct methods of working flint-like substances with stone age apparatus.' His whole account is worthy of careful study, and to him we are indebted for the know-

ledge of one purpose of caches. From one pebble he had made 'seven finished knife and arrow blades in exactly 38 minutes;' and, 'from obsidian or glass a very small and delicate arrow-point — the most easily made, by the way — in less than two minutes.'

ARROW-HEADS

There are local varieties in arrows, as in other implements, and on some sites one type may prevail to the exclusion of almost all others, but the distribution of all leading types is very general. There are few forms of the smaller chipped implements, from the Atlantic to the Rocky mountains, which may not be matched in form in New York, whether it be arrow, spear, drill, scraper, or knife, the early visitors bringing them from every part. In most cases the finer ones come from a distance, while for the smaller, more common and less valuable, the hornstone of the Helderberg group often sufficed.

Some small forms have been classed as boys' arrows, but there is little reason for this, for they are much too common, and were serviceable in hunting. Many are found in New York less than half an inch in length, and they occur in quantities not over an inch long. Primitive children's arrows were used with a blow-gun.

Arrow making was a necessity to every hunter, but all were not equally skilful, and some would acquire a high reputation, finding their work in demand. A division of labor was inevitable, even in savage life, and Roger Williams described this in 1643: 'They have some who follow onely making of bowes, some arrows, some dishes, (and the women make all the earthen vessels) some follow fishing, some hunting; most on the seaside make money, and store up shells in summer, whereof they make their money.' Some of the finest stone work here, also, was that of an early day, the Iroquois having no fondness for working in stone, and restricting themselves mostly to axes, small arrows and knives. The finest material, also, is not of recent date, but of that period when men were here as hunters and fishers, rather than as residents. This is true of ornamental stone work as well, except in the very recent introduction of red pipestone, and the fine stone pipes of the later Iroquois, made with metallic tools. The stone masks also belong to the historic period.

It is impossible to draw an exact line between arrows, spears and knives, although most of them may be easily distinguished; and it is almost as difficult to classify satisfactorily the varieties of either of these implements. Dr Rau arranged arrow-heads as leaf-shape; convex sided, with truncate base; triangular; triangular, but with indented base; notched at the sides, with convex, straight, or indented base; stemmed, but with various bases; barbed and stemmed. Others have suggested additional groups, but nothing exactly covering all has yet been proposed.

The common form of cached articles in New York is a straight base, straight or slightly concave edges gradually expanding to the full width of the stone, whence longer curved edges contract to the point. These coarsely flaked implements are commonly from four to five inches in length, and sometimes scores occur in one cache. Although usually of the drab, grey or dark hornstone, this is not invariable, nor is the size always the same. They may be found near streams navigable by canoes, but not always close to them. In some cases they are comparatively distant from prominent routes or resorts, but in places favorable for hunting or fishing. They are frequent in New York, and fig. 1 is typical of a large class often used without change. It is one out of a cache of 29 of the same form, and is four inches long, but among the rest were some larger.

Those which Dr Rau called leaf-shaped arrows, seem to be knives as a rule; at least they might have been used as such, and it may be best to refer them to that class. In most cases his convex sided arrows, with truncate bases, seem knives also. The triangular forms, with either the straight or indented base, are true arrow-heads, and these were favorites with the Iroquois, who seldom used others. Their use was not confined to them. Triangular arrows with straight bases are somewhat rare, but the other form is common, and sometimes very slender and beautiful; true arrow-heads, though suggestive of drills. They vary from one to two and one-half inches in length, and on some sites no others will be found. When the Iroquois had brass to use, they retained their favorite form, and the metallic point was simply sheet brass, cut in a long triangle, perforated or not.

To Dr Rau's classification may be added two kinds of bunts, which are divisions of the stemmed arrows, sometimes with expanded

bases; pentagonal and straight sided, double notched, and what is locally known as the shark's tooth form. These might be placed in his classes, although he gives no examples of these forms. Some of them are somewhat local, and beveled arrows may prove to be scrapers.

The various forms of triangular arrows are often called war arrows, and Catlin makes a distinction between war and hunting arrows of a little different nature. (See *North American Indians*, 33). He says that the quiver 'generally contains two varieties. The one to be drawn upon an enemy, generally poisoned, and with long flukes or barbs, which are designed to hang the blade in the wound after the shaft is withdrawn, in which they are but slightly glued; the other to be used for their game, with the blade firmly fastened to the shaft, the flukes inverted, that it may be easily drawn from the wound, and used on a future occasion.' If the barbs are the essential distinction, many other forms besides the triangular would be called war arrows.

The wonderful rapidity with which Indians send their arrows has been remarked by both early and recent writers, and this argues a corresponding facility in making them. They were not confined to war and hunting, but were largely employed in shooting fish. Father Rasles mentioned this when he was among the Illinois in 1693. When they wanted fish, 'they embark in a canoe with their bows and arrows, standing upright, for the purpose of more easily seeing the fish; as soon as they perceive it they pierce it with an arrow.' This method was noticed farther east, and in Johnson's *History of New England*, 1654, it is said, 'Their Boyes will ordinarily shoot fish with their Arrowes as they swim in the shallow Rivers, they draw the Arrow halfe way, putting the point of it into the water, they let flye and strike the fish through.' Loskiel mentioned the same thing in Pennsylvania, in the last century, 'Little boys are even seen frequently wading in shallow brooks, shooting small fishes with bows and arrows.' Lawson (1714) observed the same thing in the Carolinas, and other early writers refer to it elsewhere. This is one reason for the abundance of arrows along rivers and streams, and this would allow of much larger heads than the usual 'regulation size.'

Triangular arrows with concave bases are widely distributed, and in New York their chief distinction is in material and breadth. In

Europe they seem rare. Sometimes they are almost equilateral; at others nearly as slender as many perforators. They are usually neatly chipped and thin. Fig. 2 is a small example, about as broad as long, being an inch in extent. It has a concave base, and is of common flint, slightly mottled. This comes from the Seneca river, where it is a frequent form. It is sometimes much smaller. Fig. 3 is of brown flint from the same stream. In this, however, while the base is more deeply concave, the lateral lines are slightly convex instead of straight, and the width exceeds the length, being one and three-eighths inches. Fig. 4*a*, a still broader form, seems a true arrow, and yet there are reasons for thinking it a knife. It is of common dark flint, and is one and one quarter inches wide. Fig. 4*b* is an extreme form of this, from Cross lake. It is of an obscurely banded drab flint, and the width is one and eleven sixteenths inches, more than double the length, if we call it an arrow, but its proper place seems with the knives. Fig. 4*c* shows the other extreme of this somewhat rare form. In this all the angles are a little rounded.

Three early forts, near Baldwinsville, have afforded some of the finest examples of the straight sided, slender triangular arrows, varying from one and one quarter to two and one half inches long. From one of these, a stockade on the north side of Seneca river, come both broad and extremely slender forms, with all intermediate grades. Fig. 5 is one of these, one and one quarter inches long, and of dark flint, proportionally quite as broad as those so frequent elsewhere. Fig. 6 is of light drab flint, and is two and one half inches long, the utmost limit technically allowed for arrow-heads. It will be seen that an inch more would add little to its weight, or resistance to the air. Fig. 7 is of the same material, and from the same place. It is two inches long, and another almost as long is very much narrower.

An Onondaga stockade, occupied about A. D. 1600, has this smaller and broader form, but with few examples. It occurs a little later in time, in common flint, in a stockade a mile south of Delphi, but is not as neatly chipped. An Onondaga stockade south of Pompey Center, apparently occupied about 1640, has the same form and material. Fig. 8 is an example, one and one eighth inches long. Some are smaller than this. Most of these later specimens are small,

and have a deeply indented base. They occur on Indian hill in Pompey, the site of the Onondaga town which Father Le Moyne first visited in 1654. Fig. 9 is a beautifully mottled one from Watervale, in the same town. It is two inches long, and is exceptional in material, as most of these are of common flint.

In the early Mohawk towns the same favorite Iroquois arrow appears, but in a ruder form. Fig. 10 is a curious example from the earthwork in Minden, near Fort Plain. This work seems to have been one of the earliest triad of Mohawk forts, occupied respectively by the three clans of Turtle, Bear and Wolf, and having suggestions at least of European contact. Squier's statement that European articles have been found there, seems premature. This arrow point is of grey flint, one and one quarter inches long, and may be unfinished, as it is flat on one side, and much ridged on the other. Fig. 11 represents another of the same material, and much like the last, except in having a lower ridge and deeper base. This comes from a Mohawk town east of Wagner's Hollow, which has afforded some of the most remarkable relics of the early historic period. Although usually of common flint, fig. 12 shows a very pretty white one from Baldwinsville, which is not only a good example, but is very finely serrated.

There are distinct varieties of the triangular arrows, and fig. 13 represents one of the rarest of these from the double walled earthwork, three miles southeast of Baldwinsville. It is of a beautifully variegated and lustrous flint, with a distinct groove in the center of each surface, tapering from base to point. The base is much indented, though not as deeply as in some, and the length is two and one eighth inches, with convex edges. The locality is of importance, as showing this to be an Iroquoian form. Fig. 14 shows another of these from Cross lake, two and one half inches long, which is very fine, and of a light bluish grey flint. Other fine examples might be given, for though somewhat rare, it is widely distributed.

Another variety, in which the edge presents a double curve, is locally called the shark's tooth form. Jones, in his *Antiquities of Georgia*, calls most triangular arrows the shark's tooth form, but in New York it is restricted to a peculiarly curved outline. Fig. 15 is

an extreme form of this, made of common flint, one and three quarters inches long. It is remarkable for its obtuse barbs. This was found on Onondaga lake. Fig. 16 represents the typical form, with gentler curves and sharper angles. It is a large specimen from Ithaca, of dark flint, and two and one quarter inches long. Many differ hardly at all from this except in size. Fig. 17 is a slender form from Brewerton, of common flint, two inches long. They are rarely as slender as this, but many intermediate varieties occur, none of which have slender barbs. Good examples seem almost peculiar to New York.

Notchless pentagonal arrows are moderately distributed, and occur in several materials. Fig. 18 is one of common flint, from the town of Van Buren, and has angles somewhat rounded. It is quite flat, and one and three quarters inches long. They are usually quite as broad as this, though slender forms occur. A ruder and more massive one, of the same size and outline, comes from Baldwinsville. It is made of a piece of common hornstone, which unites the light clay color and the dark drab tint. They may be either arrows or knives.

The name of bunt has been adopted for a class of stemmed stone arrow-heads, with broadly rounded or obtusely pointed ends. The term was first used in Missouri, and while Mr A. E. Douglass, of New York city, has 753 Missouri specimens in his collection, he reports none from this state. They are frequent farther south and southwest, and seem here most abundant on the Seneca river. In outline they often have the scraper forms, and are sometimes confounded with them, but the class will hold good. To this day the Onondagas use blunt headed arrows made entirely of wood, as they probably always did. Sometimes those of stone seem to have been merely broken arrows, long ago recut for use, as in fig. 19, from Seneca river. Of course this might have been used for digging purposes, like longer ones of this form, but it seems too short for this. In this specimen there is no perceptible difference in the flaking, as though it had a secondary use. It is one and one half inches long. Fig. 20 shows a longer and straighter form, made of light grey flint. This is quite thick, and about one and three quarters inches long. Fig. 21 is a typical form, of which there are many examples. It is

of common flint, and is one and one half inches long. Most of these are from Onondaga county. The same form often appears in scrapers. Fig. 22 can hardly be assigned any other place, although too long and heavy to be strictly called an arrow, being two and three quarters inches long, and very coarsely chipped. It is of common flint, and occurs on the Seneca river in smaller sizes. As an arrow it might have been used to stun fish.

Fig. 23 is a fine arrow of the bunt form, quite flat, and with a finely rounded edge. It is one and three eighths inches long, and is made of a fine brown flinty sandstone. In this the stem expands at the base. Fig. 24 is even finer, and is of dark blue flint, about one and one quarter inches long. It differs from the last in having distinct barbs. Fig. 25 has a simple rounded stem, and is a beautiful specimen, made of light grey and lustrous jasper. It is from Cross lake, and is nearly one and seven eighths inches long. This is more properly a scraper, for though it is neatly chipped all over both sides, yet one side is much the flatter, and the edge is cut at the usual angle. It may be considered an intermediate form. A large proportion of the bunts on Seneca river have the rounded end, but some are angular. They are quite variable.

Among the stemmed but notchless forms are many having a suggestion of barbs, and of the kind which Catlin called hunting arrows. This projection, when not carried below a horizontal line, is now called a shoulder, and is a frequent feature. The edges may be straight or curved, and they are so common as scarcely to require illustration. Fig. 26 is a good typical specimen, made of light grey flint, and one and seven eighths inches long. This is from Cross lake. An infinite variety will be found in this simple form, produced by variations in length, breadth, and proportion of parts. Fig. 27 is a very odd example, of yellow jasper, suggesting both the pentagonal and bunt arrows, and having deep notches. A little central point also suggests the drill. It comes from Tonawanda and is but little over an inch long. Fig. 28 is still more curious here, being more like extreme western forms than those of New York. It is very small, too, though others here, of a different outline, are less than half the length of this. It might be described as a narrow and a

broad triangle, united by their bases. It is of flint, one and one quarter inches long, and is said to have been found on Grand island, in the Niagara river. Fig. 30 is a very small and pretty arrow of yellow jasper, three quarters of an inch long, and comes from Amboy, west of Syracuse. Yellow jasper is a common material for small arrow heads.

Fig. 31 represents a very common form. This is of white flint, two and one eighth inches long, and comes from Brewerton. It is neatly chipped, and has a slightly expanding base. There are many small and often good specimens of this form, usually quite slender, and made of the nearest hornstone, but fine examples occur on most indian sites, except those of the Iroquois. Beveled arrows are commonly of this form.

Among the notched or shouldered arrows, of every variety, more or less occur which are of a spiral or twisted form, but whether this came from design may be a question. The indians were aware of the advantages of a rotary motion, and learned to rifle smooth bore guns very neatly for themselves. Loskiel said, 'Many of the Delawares and Iroquois have learned to make very good rifle barrels of common fowling pieces, and keep them likewise in good repair.' On the other hand, the triangular Iroquois arrow-heads, whether of metal or stone, were made as flat as possible. Obviously, a rotary motion was not always desirable in the woods, and to this day the Onondagas do not feather their own arrows, though they will do it for others. Accordingly, as the spiral twist is the exception rather than the rule with stone arrow-heads, and is quite as frequent in knives and spears, this feature is to be ascribed to the first flaking of the material, rather than to design. It may be observed that in the picture of the battle on Lake Champlain in 1609, the indians on both sides have feathered arrows, as is the case in the picture of a Susquehanna warrior made about the same time, and this might be thought the idea of the European artist, rather than the fact, were we not told elsewhere how the southern indians affixed the feather. When required, the Onondagas feather their shafts very simply and neatly. The shaft of the feather is split, one side only being used. The anterior part of this is stripped and bound on the arrow shaft,

pointing toward the notch. Then the feathered part is reversed, given a slight twist, and bound firmly at the end. As this spiral twist is said to be purely American, some have claimed that thence came the idea of rifling gun barrels. This feature, however, appeared in Europe as early as 1520; even earlier as regards the mere groove.

Another arrow form is not distinctly notched in the usual way, but has an angular indentation on each side. Fig. 32 is a good illustration of this. It is of common flint, one and one half inches long, and was found on the Seneca river. Such arrows are quite flat, and might easily have served for knives. Fig. 33 is of the same form, but a little larger, being one and three quarters inches long. It is of brown flint, and was found on Oneida lake. These are typical of many others, but some are proportionally very long. Fig. 34 is an intermediate form, with curving instead of straight outlines, and this also is typical of a large class, many of which are not more than half this length. It was found on the Seneca river, and is one and five eighths inches long. The material is that whitish flint, so commonly used in some parts of Illinois, and which is frequently seen in arrow forms in New York.

Some parallel sided angular arrow-heads are both remarkable and rare. Two of the best specimens of these were found on the Seneca river, more than ten miles apart, and no one can doubt they were made by the same hand. Both were picked up by the writer, one being at first thought a broken arrow, as it lay on the ground. Fortunately something about it arrested attention, and a slight examination revealed its great value. For comparison, as well as on account of their unique character, both are represented in figs. 35 and 36. They are quite thin, one and one eighth inches long, angular and straight sided, and are of drab flint. The notch on each side distinguishes them from some other forms. One much like these was found at Newark Valley, of the same material, but slightly larger. It differed in having a distinctly concave base. Fig. 37 has a resemblance to these also, but is much larger and ruder, although thin. It is of a grey flinty limestone, and was found on the east side of Skanateles lake. The length is two inches, and the width but very little less. Fig. 38 shows one from Herkimer county, of common flint, and

one and one half inches long. It is not as symmetrical as the parallel sided ones mentioned, and it has a notch in the center of the base, besides those in the sides. There are other examples which are much less striking than these.

Fig. 39 is of yellow jasper, with curving edges, and somewhat thin. It is an inch long, and has long barbs, a feature not common here. It has the needle-like point, found in many arrow-heads, but usually more distinct than in this. This feature is shown in a broad way, though by no means typical, in fig. 40, which is of black flint, one and five eighths inches long, and from the Oswego river. This has long barbs, though shorter than in some imperfect specimens, such slender projections being peculiarly liable to fracture. Its general character is more like articles from Ohio than New York. Fig. 41 is the most remarkable for material, being a shark's tooth, perhaps a fossil, one and one half inches long. It has been deeply and narrowly notched, but is otherwise unchanged. It may be a memorial of the Iroquois wars with the Catawbas and other southern indians, or it may be of an older day, for, although found near an historic Cayuga site, its age is uncertain. It was found in a grave near Union Springs, on the east side of Cayuga lake, by Mr S. L. Frey of Palatine Bridge, whose account may be quoted. 'The burials at this place were very numerous, and judging from the state of the bones, older than the coming of the whites, unless a single glass bead which I found there, would seem to indicate white trade. At this place, associated with many small shell beads, or rather shells used for beads; was the arrow referred to. It is perfect, and just as it was in its original state, except the two slits which have been cut for fastening it to the shaft. The enamel is as hard, glassy and perfect as ever, and it is really a unique specimen, as far as my explorations go. I think similar ones were used by the southern indians.' The locality is one where there were early and recent cemeteries and villages, but on the whole the grave was probably comparatively recent. Perforated fossil shark's teeth were used as ornaments in Georgia.

A few double notched arrows appear, but this feature is more frequent in the spears, where the advantage would be greater. In

fact these are so large that they might well be called a small form of spears. Fig. 42 is one of grey flint, and comes from Brewerton, where spears of the same kind are found, and it differs from them only in size. It is two and one half inches long, one corner of the base being broken off, so that but one notch remains on that side. The notches are neatly made. Fig. 43 is a curious one from Onondaga lake, of the same length, and of common flint. It is much thicker than the last, and has a narrower base and broader notches. A similar base appears in one from Seneca lake, though somewhat wider. The latter may have a more definite claim to the title of arrow, being one and seven eighths inches long. It has a rounded point, and the notches are neatly cut. This is the smallest of these thus far reported.

The ordinary notched or shouldered arrows, the most abundant of all, occur in several varieties. Those with widely expanded bases are frequent in central New York, and are usually quite thick, although not invariably. Fig. 44 shows one of blue flint, from Nine Mile creek, in Onondaga county. This has a base one and one half inches wide, making the three sides nearly equal. So broad is the point of the next that it might be classed as a bunt. This is shown in fig. 45, which is of common hornstone, one and one quarter inches wide, and with a concave base differing a little from the last. In both of these the broad wings of the base are notable features, well brought out by the deep notches of the lateral edges. Fig. 46 represents another frequent form, which may be thin or thick, long or short. This one is of a variegated drab flint, one and one half inches long, which is a very frequent size. It comes from the Seneca river, and differs from the last in being longer, having shallower notches, and a straight base. There are many beautiful examples of this form, and it was well adapted for preservation, specially when thick. It may be observed that many such arrows are thickest toward the point, thus allowing the thinner part to be inserted in the shaft.

Fig. 47 is a more slender form, also somewhat common, though not usually as fine as this. It will be seen that most of these are simply notched triangular arrows, many of them quite as thin as in that characteristic form. This specimen is of drab flint,

one and three quarters inches long, and was found at Baldwinsville. One a little broader, but only one and three eighths inches long, was found at the same time and place. Some smaller and thicker forms are less deeply notched. They are among our most beautiful arrows.

It may be remarked that some eccentric forms were probably personal, or at least tribal, used to show ownership or nationality. It has been pointed out that two arrow points already figured, were made by the same man, so rare is the form, and so close the correspondence. If stolen or lost for a time he would have no difficulty in identifying his property. This extended into a national feeling. As we have seen, in recent times the Iroquois used the triangular arrow almost exclusively. If other forms were then as characteristic of other nations, the form of the arrow used would indicate the actors in any sudden raid, and these often had a pride in making themselves known. There are several instances in early history, where tomahawks or war clubs were used for this purpose. Thus, a Canadian indian, on a scout on Lake George in 1690, saw the English and Iroquois making canoes. Failing to make a prisoner he 'suspended three tomahawks within sight of their cabins, indicating to them that they were discovered, and that he defied them to come to Montreal. These tomahawks are a species of club on which they carve figures, and in that way manifest their wishes.' In speaking of some depredations committed in 1695, near Montreal, the French said, 'These blows were struck by some Mohawks and Oneidas, as we discovered by their tomahawks, which they left sticking in the ground, according to their custom.' It will be readily seen that a warrior who wished to be renowned might adopt a distinct form of arrow as his own, and be allowed a certain informal copyright. His arrow would prove his deed, whether in hunting or war. This, of course, could not be carried out to any great extent, and yet will account for some exceptional forms. Personal taste may well be allowed a place, but in a few instances a higher purpose may have been connected with it, and there is no doubt at all that little peculiarities clearly distinguished the implements and arms of various nations. Among the remaining Iroquois the snow snakes of the Onondagas and Senecas might seem precisely alike to the casual observer, and yet they have perma-

nent distinctions. The same considerations have their application to very many other things. Closely related as they were, each Iroquois nation had its own fashions.

Fig. 48 is not common, and the work is somewhat coarse. The basal line is also convex, a rare feature in this form, unless there is a central notch or double curve, as in some of the following. The lateral notches are also deep, and the implement is beveled. It is of brown flint, one and three quarters inches long, and was found on the Seneca river. Fig. 49, from the same place, is by no means rare, though quite variable. This is of brown flint, one and one half inches long, and with a basal width of one and three sixteenths inches. The notches are quite deep, and the cutting edges convex. The base is hardly as concave as in most of this form, which is of wide distribution, extending far to the south and west. Fig. 50 is of the same general form, but has a hollower base and straighter edge. This is of brownish white flint, and comes from Brewerton, at the foot of Oneida lake, for ages a favorite resort of the aborigines. It is one and five eighths inches long. Fig. 51 is of dark brown flint, one and seven eighths inches long, the base being one and one quarter inches wide. This is also concave, and the implement is thick. It comes from Onondaga lake. Fig. 52 is another, made of common hornstone, with a fine concave base. The full length is two and one quarter inches, and the base is one and three eighths inches wide. It was found at Baldwinsville, and the form is rather frequent in that vicinity. A much smaller one, with some peculiarities, comes from the same place. It is but little over an inch long, and the base is much deeper and more indented. This form even occurs in quartz, but with less elaboration.

Some of the smaller arrow-heads have peculiar features, and slender ones, with one sided bases, occur occasionally. Fig. 53 is a good illustration of these. It is of drab flint, one and five sixteenths inches long, and quite inequilateral in every way, so much so as to make it a question whether it should not be called a very small knife. They are hardly common, and those figured here are from the Seneca river. Fig. 54 is another of these, of the same material, but proportionally much wider than the last. It is but little over an inch long,

and browner than the one preceding it. Fig. 55 is of the same brownish hornstone, but perhaps more like limestone, and less neatly chipped than the others. It is also more symmetrical. It is one and five sixteenths inches long. The first may be considered extreme forms of these.

Fig. 56 has a double curved base, angular in the center, and is of an obscurely banded dark blue flint, rather thick, and two inches long. It comes from Seneca river, where there are many modifications of the form. Fig. 57 is from Wood creek, east of Oneida lake, an early thoroughfare in historic times, but less so at an earlier day. It is of common flint, two inches long, and has the double curved base more deeply notched than the last. It has also a much narrower and more rounded base, this being less wide than the main part of the arrow. They are sometimes distinctly barbed, rather than shouldered. A beautiful one of variegated brown flint, two inches long, comes from near the Seneca river.

Fig. 58 is from the same vicinity, and is of a light brown flint, with two black bands appearing on one surface. It is quite thin, and is one and one quarter inches long, the base being seven eighths of an inch wide, this being the broadest part. The form is quite odd in several respects, being somewhat angular, and with straight converging sides. Fig. 59 is another broad and peculiar form, less prominently notched than the last, but almost as nearly triangular. It is of drab flint, and quite thick. The length is two and one half inches, and the breadth one and five eighths inches. It comes from the Seneca river, and might be called either arrow or knife. It would be rather heavy for the former, unless used at close quarters or in shooting fish. It must be remembered that much of the primitive forest archery was at short range.

Fig. 60 is much like the last in outline, though with a deeper base, like some preceding forms. It is small for so neatly made an implement, being considerably less than an inch in length. This is of light colored flint, and is also from the Seneca river. The surface is even, and the outline very symmetrical. Fig. 61 resembles the last, but is a ruder specimen, being quite thick and ridged through the center. It is of dark flint, one inch long. This form is quite abundant

along the Seneca river, and varying examples will be given later. Although small, they are quite large enough for effective use.

Fig. 62 is a very rare and beautiful arrow-head, made of light bluish flint. The point has been slightly broken, and was acute, making the original length one and one half inches. It is straight but not parallel sided, the base is deep, and the notches so much enlarged within as to give both base and sides the appearance of approaching barbs. Its most striking feature is that of expanding above the notches, until half way between these and the point. The surface is flattened. This unique specimen came from the Seneca river, which was a favorite early resort, both for its own advantages, and as being the outlet of so many lakes. At every rift are found camps and hamlets of varying age and character, and these rifts are quite frequent in its long course, which was easily navigable by the indian's light canoe, as it has since been traversed by the larger vessels of the white man.

Fig. 63 is a small, but prominently shouldered arrow-head of opaque white flint, found opposite Three River Point, where the Oneida and Seneca rivers unite to form the Oswego. The junction of two such important streams made this a natural stopping place, and many arrows and spear-heads of similar material have been found there. This is but one and one eighth inches long, and several have been collected of similar form, but usually smaller. In this all the outlines are concave, except the lowest of all. Fig. 64 is another of these, from the Oswego river, and but one inch long. It is of dark blue flint, and every way more slender than the last. The base is wider, and it was distinctly barbed, but one of the barbs has been broken. Fig. 65 is of drab flint, and was found at Baldwinsville. It is but seven eighths of an inch long, and has a deep and expanded base, but has a strong general resemblance to the preceding. On comparing these with articles from other places, this may be regarded as a rare form. Neither Rau, Abbott, nor Fowke give any figures closely resembling it.

Fig. 66 has been referred to before, among those arrow-heads which have concave bases. It is a fine example, with a deeper and more angular base than usual, while it is also quite small. It is of

drab flint, one inch long, and quite thick. It was found on Seneca river.

Fig. 67 is a beveled arrow of drab flint, two inches long, and from the same locality. Besides the bevel on each lateral edge, the basal edge has also its bevel, which is not a common feature, and it is more slender than is usual with implements of this type and size. These are rarer here than farther west, and suggest scrapers. Those which are large enough to be classed as spears are sometimes quite slender. While the elaborate work distinguishes them from the broad flaking of the under side of the common scraper, it is difficult to assign any other use to the characteristic edge. At the same time, this edge is sharp enough for many cutting purposes, the bevel resembling that of a chisel.

Fig. 68 is a rare form from Wood creek, east of Oneida lake. It is of common flint, one and seven eighths inches long, indented but not notched, and presenting curved lines in every part. Except in the expanded base, it is much like one of the finest forms of knives, and might have been used either for knife or arrow.

Fig. 69 is a fair example of those arrows which end in a needle point, though this point is scarcely as slender as in some others. This is of drab flint, one and three quarters inches long, and was found at the mouth of Chittenango creek, where it enters Oneida lake. Such specimens are rarely perfect, but they often preserve the slender point, even when broken elsewhere. This curious feature suggests a union of the knife and drill. It has scarcely attracted attention elsewhere, nor are good examples frequent in New York. The points are too neatly worked to have been accidental, and they are too delicate for any rough usage, thus leaving their purpose to be conjectured.

Fig. 70 is quite another type, having convex edges and a slender base. It is of drab flint, two and one quarter inches long, and may have been either arrow or knife. It was found not far south of the Seneca river. The point is rounded, which is its main distinction from the next. Fig. 71 is not quite two inches long, and is of black flint, with sharp and thin edges all around. It is found in the same vicinity, and the same remarks apply to its use. This is straight and

symmetrical, but in some examples the surface is so distinctly curved as to leave no doubt of their being knives. This is true of other forms.

Fig. 72 is an unusual form of the triangular arrow or knife, having a truncate base and convex sides. It is of common flint, one and one quarter inches long and very thin. This comes from Owego, on the Susquehanna, and is quite rare in this state, and probably elsewhere. Neither the truncate base, nor the convex edges are features of our triangular arrows. Usually the base is indented, and the sides straight, but in larger implements both features may appear, and often do, separately or together.

Fig. 73 is a broad, notched, and finely serrated arrow-head of dark flint, from Seneca river and one and seven eighths inches long. Distinctly serrated flints are quite rare in New York, but frequent farther west and south. Those most distinctly serrated, and preserving the knife or arrow form, have been considered saws, and might well have been used as such. This was Evans' view of those found in Great Britain, but it has met with but moderate endorsement here. This feature, however, is so conspicuous in some that they will hereafter be referred to as saws in this paper, simply as a possible use.

Fig. 74 is a thick stemmed arrow-head of dark flint, two and one half inches long, and found on Seneca river. It is distinctly shouldered, and has a convex base and edges. The form is quite common. Fig. 75 is of quite a different character, resembling some before figured, but with a narrower base, the lateral edges also presenting two nearly straight lines. This is two and one eighth inches long, rather thin and of dark common hornstone, from the same vicinity. Fig. 76 is quite curious in form, although one of the stemmed arrows with expanding bases. It is quite thick, while at the same time slender in outline, and is of dark flint, two inches long. The work is rather coarse.

Fig. 77 is almost unique, while having the leading features of some preceding forms. It is one and one half inches wide, and but one and one quarter long, broadly shouldered, and with a concave expanding base. The straight edges meet at an obtuse angle. It is of light colored flint, rather thick, and like the last, comes from the

Seneca river. The base has a double curve. It is a fine example of a rare form.

Fig. 78 shows a frequent form which is often rude. This, however, is neatly made, and is ridged on both sides. It is of brown flint, two and one quarter inches long, has a long stem, and is from the same place. Such forms are often flattened on one side, and ridged on the other. Fig. 79 is a small arrow of drab flint, rather flat and a little curved. It is but seven eighths of an inch long, stemmed and broad. This is also from the Seneca river. Triangular arrows are found there even shorter than this.

Fig. 80 represents one of the commonest forms, and one very variable in size, material and finish. They are usually coarsely made, and probably were rapidly finished and little valued. This one is of black flint, and is one and one half inches long. They are often much smaller, and on many sites scarcely any thing else occurs. In assigning these small points to boys, the fact has been overlooked that the efficiency of an arrow-head was not in proportion to its size. Its office was simply to open the way for the shaft which propelled it, and for this purpose it needed only to be sharp and slightly larger than the shaft itself. Thus Verrazano, in 1524, found the Long Island indians using arrows tipped with fish bones, while farther east many had them tipped with stones. In an account of New England indians, written in 1620, it is said, 'For their weapons they have bowes and arrowes, some of them headed with bone, and some with brasse.' Capt. John Smith said that the indians of Virginia had many arrows headed with bone. Others used sharp stones, turkey spurs, or birds' bills. The Sasquehanocks whom he met in 1608, had arrows a yard and a quarter long, 'headed with flints or splinters of stones, in forme like a heart, an inch broad, and an inch and a halfe or more long.'

It will be observed that the writer differs from some on the true distinctions of arrow-heads, while following the usual classification as a matter of convenience. The small points were not made merely for children, but were useful to men. Length is a less essential feature than breadth, and some long and slender forms may have been used as arrows, where shorter and broader forms were not.

Obviously, half an inch added to the width, or a doubling in thickness, would have produced more resistance in the air than a much greater increase in length. At the same time, for certain purposes and where the range was short, as in the shooting of bears or fish, neither an increase in weight or breadth would have been a disadvantage. In a general way, more than one form would be found in the quiver, even while a special object was kept in view. Sir John Franklin unexpectedly met a party of Eskimo in 1825. These at once changed their hunting arrows for those of war, showing that they were well supplied with both. This distinction of kinds probably went much farther. The hunting arrows themselves were adapted for different kinds of game.

Fig. 81 is another of these small arrow-heads, made of dark flint, and one and one quarter inches long. Fig. 82 is a little smaller, being one and one eighth inches in length. Fig. 83 is a fine arrow of white quartz, two inches long. All these are from the Seneca river, and others of these simple stemmed forms present many variations.

Fig. 84 is a large and broad arrow-head of drab flint, from Onondaga lake. It is quite thin, and is two and one quarter inches long. This would have served quite as well for a knife, and is notched and well worked. Fig. 85 is from the same vicinity, and is more distinctly notched, and also much narrower. It is of blue flint, and is two and one eighth inches long. The base is slightly wider than the blade. This form is quite frequent in larger sizes. Fig. 86 is a very neat notched arrow-head, from the same place. It is made of common hornstone, and is one and three quarters inches in length, being both thin and symmetrical. Fig. 87 is quite curious, and comes from Oak Orchard, on the Oneida river. It is made of olive slate, of uniform thickness, and the edges alone are worked, much like a scraper. Arrows made of stratified material are hardly rare, but slates like this are seldom seen adapted to such uses.

Fig. 88 is a large barbed arrow, nearly two and one quarter inches in length, and made of a bluish drab flint, variegated with white quartz. It was found, with others of similar material, near Three River Point. The barbs are well preserved, and the work is good. Fig. 89 is a small notched arrow of brown flint, one inch long, and

comes from Seneca river, where many of this form have been collected. Fig. 90 is another neat little arrow-head from Onondaga lake. It is of light brownish drab flint, one and one eighth inches long. It has a wide base, and is almost barbed. Fig. 91 is a rare and beautiful form of the angular arrow-heads with parallel lateral edges. It is quite deeply notched, and differs from those already figured in the graceful concave sweep of the broad base. This unique article, of dark flint, and about one and one quarter inches long, was found at Newark Valley, Tioga county.

Fig. 92 is a small beveled arrow of dark flint, from the west shore of Cross lake, and is waterworn. Many articles are found in this condition in streams and on shores. This has a stem broadly indented on three sides, and is of unusual form for an article of this description. It is one and three eighths inches in length, and like all of its class, might easily be considered a form of scraper.

Fig. 93 has also a concave base, but much narrower. It is shouldered, and has a finely serrate edge, of irregular outline. The form is that of many Ohio specimens, and it is of a dark flint, one and one half inches long. It was found near Three River Point. Fig. 94 shows a very neat and unusual form of the notched base arrows, but it has the three conspicuous concavities which mark the last two examples. The point is broadly rounded, and while the length is but little over an inch, the width is seven eighths of an inch, from point to point. It is of common flint, and was found at Newark Valley. Fig. 95 is classed as an arrow-head, but is much like the flints so often found in caches, although smaller than most of these. It is of a light brownish grey flinty limestone, and is quite thin and sharp. The length is two and three eighths inches, and it was found on the Seneca river. Although this form, being symmetrical, is popularly classed with the arrows, its proper place seems to be among the knives.

Fig. 96 is a pretty stemmed and shouldered arrow-head of red jasper, from Baldwinsville, and is but little over one and one half inches in length. While articles of yellow jasper are quite frequent in New York, those of red jasper are rare, and sometimes, even then, the color may have been changed by heat. Fig. 97 has much the same outline, but is distinctly grooved at the base. It is a fine

article, of blue flinty limestone, and is one and five eighths inches long. It comes from the same vicinity. From its general width Fig. 98 would be called an arrow-head by many, and yet its general character is that of a perforator. The worn appearance of the point tends to confirm this view, though this may have come in other ways, as in digging, for which it seems partially fitted. There are so many forms intermediate between the arrow and the drill, that it is now described with the former, in spite of a strong conviction that it belongs to the latter. It is coarsely flaked, and is two and one eighth inches long. This also is from the Seneca river.

Fig. 99 is of purplish flint, thick and smooth, and is two inches long. It is a form not so common in arrows as in spears, and this is round pointed. The rounded base is found almost everywhere, but perhaps is nowhere very common. This fine specimen is from the Seneca river, where the larger forms sometimes occur. Fig. 100 is a triangular arrow-head of common hornstone, from Onondaga lake. Its special feature is the straight and expanded base, which is also quite sharp. The length is one inch.

Fig. 101 is a broken article, but given to show a good example of what has been called here the needle point. It is very attenuated, and the section added will show how thin and delicate it is in every way. This fragment is of very thin, dark blue flint, now about two inches long, and nearly one and one quarter wide. It was found on the Seneca river, where similar specimens sometimes occur, though not very often. If found elsewhere they have not been reported, but they are so often broken that they may have escaped attention.

A large proportion of the arrow-heads figured are from Onondaga county and vicinity, partly because these were easily accessible, but partly, also, because there they are found in greater variety than in most other places, this arising from natural causes very important to primitive man. Notable forms from other parts have been figured when possible.

While it is of importance to know how widely some leading forms are distributed, and what is their comparative abundance, the study of man's early history here requires that some unusual forms should

be recorded and illustrated. These are often the links which serve to connect widely separated sites. The knowledge already gained of the primitive articles used by the Iroquois, three centuries ago, has become of great and increasing value, and will hereafter aid in solving many problems. Different nations and ages had differing fashions, and the characteristic articles used and left behind, will throw much light on the early people of New York. To collect these articles for careful comparison, to illustrate them so faithfully that distant students may have the most significant facts before them, is something worthy of the attention of a state which has already done so much in the cause of science.

SPEARS

As with arrows, so is it difficult to place an exact line between knives and spears. Indeed the primitive spear may often have been but a knife fastened to the end of a long pole, as men in more recent times have armed themselves, when lacking suitable weapons. Even arrow-heads may have been put to the same use in time of need. Spears and knives may both have been leaf-shaped, stemmed or notched, and may not differ in the least in outline. Often the thickness and sharpness are the only distinctive features. As regards size, this does not affect knives, but usually small points are called arrows, and the large ones spears.

Dr C. C. Abbott made a division of spears and lances, while L. H. Morgan, in his *League of the Iroquois*, omits spears from his description of their weapons. In his subsequent account, in the *Regents report* for 1852, he says that they did not use them, and although he simply asserted this it was not without some reason. Spears do not generally appear in early pictures, nor are they usually mentioned in accounts of early indian armor. As far as the pictures go, this is of little importance. They were sometimes, perhaps usually, drawn by European artists from descriptions given them, and they availed themselves of the privileges of art. Champlain expressly said that the Mohawk chiefs, whom he killed in 1609, wore arrow-proof armor, but in the picture they are as naked as all their followers. Capt. John Smith said of the Virginia indians, 'They of Accawmack

use staves like unto javelins, headed with bone. With these they dart fish swimming in the water.' This, however, may have been like the early Iroquois bone harpoon, barbed only on one side. The wooden sword, worn on the back, and sometimes with a deer's antler inserted, was mentioned by him, but no farther described. A strong point in regard to use is that on no Iroquois site in New York, has any early article been found which could be called a stone spear-head. At an early day they were abundant.

On the other hand, in his picture of Atotarho, David Cusick placed a spear in the hand of one of the messengers. Bruyas has allusions to spears in his early Mohawk lexicon, and their occasional use may be inferred from the *Jesuit relations*, but somewhat obscurely. The Iroquois sword, whatever that may have been, was often mentioned. Schoolcraft gives the word for spear in several Iroquois dialects, and Zeisberger uses for lance the name which appears in another lexicon, half a century earlier. One Virginia picture has indians with fishing spears, but these are described as having wooden points, not metal or stone. A weapon so useful was not likely to be abandoned until a substitute was found, but it seems certain that the large stone spear-head was not generally in use here three hundred years ago. History and archeology agree in this.

This is another of the curious proofs of a change in race and occupation. Iroquois and Algonquin alike seem to have known little of the higher stone art of their predecessors, and a weapon once everywhere abundant, had almost ceased to exist. A sweeping change had passed over the land, and the new comers did not inherit the arts of the old. If they did not, how could they have been their descendants? Allowing for every resemblance, there is still a wide gulf between the indian of our northern and eastern states, as first known to the whites, and those who preceded him. This difference can only be fully appreciated by those who have early sites of a known age, to examine.

Spear-heads vary greatly in character, and still more in size, if we make the minimum two and one half inches in length. In many places this would compel us to reckon more spears than arrows; and if we remember the vast numbers carried off — for these naturally

first attracted attention by their size — the disproportion will appear still greater. At the time of colonization and earlier, the indian's bow and arrows almost alone attracted attention. If the larger points are all spear-heads, his predecessors must have been as conspicuous for these. The difficulty might be solved by supposing the bow to have been a very recent invention in America. It is rather probable, as said before, that we have placed too low a limit on arrows, while forgetting how much of forest and river archery was at very short range.

This significant disproportion will appear in almost any good collection. In the classified list prepared by Mr A. E. Douglass, he has 261 New York spears and 963 arrows; from the country at large 2172 spears and 8396 arrows, or less than one fourth, and this would be a fair proportion elsewhere. Now in New York no spear-heads appear on Iroquoian sites, which supply many small stone arrow-heads, so that the New York proportion of early spears and arrows will be yet more equal. Supposing the bow and spear were at first used together, we would conclude that the arrow-heads should vastly exceed the spears; but under the present classification they do not. It is evident that this subject needs reconsideration.

While speaking of this it may be well to say a few words farther upon indian arms, which here included both less and more than is popularly known.

As has been said, early accounts make no direct mention of the spear, although there seem allusions to it. That used in fishing was altogether of a different kind. The bow was not the short one, so efficient in the hands of horsemen, but rivaled the long bows of England, while the arrows often exceeded the cloth yard shaft. Capt. John Smith said of the Sasquehanocks, that such great and well proportioned men were seldom seen, and that they had bows, arrows and clubs in proportion. Their arrows were five quarters of a yard in length, and in the picture of one of their chiefs, his bow reaches above his head. These were of the Iroquoian family, and in Champlain's pictures of encounters with the Iroquois proper, the long bow is everywhere seen. We may, therefore, conclude that this bow, still made by their descendants, was that commonly used in our forests in early days.

Of the making of the bow and arrow something may be said later, in connection with some peculiar curved scrapers, admirably adapted for this work, but yet too rare to have been commonly used. Capt. Smith, again, says that the Virginia indians made their bows by scraping them with shells, and the Iroquois may often have done the same, as they used shells for knives. The arrow shaft was straightened in several ways, and the Onondagas have not lost the art yet. It was headed with almost any hard and sharp material, or might be made entirely of wood. The arrow point might be fastened merely with gum, in the cleft shaft, or be bound on with sinew or thread. An Onondaga recently had a triangular stone arrow given him to affix to a shaft. He at once cleft the shaft, inserted the stone, took a piece of thin sinew, dexterously and neatly wound it about the wood and stone, and the arrow was ready for deadly use. Different nations used different arrows. Thus the Sasquehanocks had stone points, shaped like a heart, an inch broad, and an inch and a half or more long. It is probable that in this way Capt. Smith described the indented triangular arrow-head, as the Sasquehanocks were of the same family as the Iroquois. The latter used triangular arrows almost exclusively. The force exerted by these simple weapons was a matter of surprise to the colonists.

Shields were everywhere in use among the Iroquois but soon disappeared before firearms. Smith speaks highly of those of the Massawomeks, who seem to have been either the Eries, or a nation allied to them, and not the historic Iroquois, as many have supposed, although of that great family. Their light targets were 'made of little small sticks, woven betwixt strings of their hempe and silke grasse, as is our cloth, but so firmly that no arrow can possibly pierce them.' There was evidently nothing like these in Virginia, and those he had and used were everywhere recognized at once, as were their other arms. Champlain describes the armor of the Mohawks in 1609, very briefly. 'They were provided with arrow-proof armor, woven of cotton thread and wood.' Corlaer saw a sham fight among the Mohawks in 1634. 'Some of them wore armor and helmet that they make themselves of thin reeds and strings, so well that no arrow nor axe can pass through to wound them.' Similar passages might be quoted from others.

The Algonquins used shields of a rectangular form, and a Dutch writer of 1671 says that these covered the body up to the shoulders. In fighting these could be set on the ground, leaving both arms free. A Jesuit father, writing of a Canadian chief in 1633, said that he 'bore with him a very large buckler, very long and very wide; it covered all my body easily, and went from my feet up to my chest. They raise it and cover themselves entirely with it. It was made of a single piece of very light cedar. I do not know how they can smooth so large and wide a board with their knives. It was a little bent or curved in order the better to cover the body; and in order that the strokes of arrows, or of blows coming to split it, should not carry away the piece, he had sewed it above and below with a cord of skin. They do not carry these shields on the arm; they pass the cord which sustains them over the right shoulder, protecting the left side; and when they have aimed their blow they have only to draw back the right side to cover themselves.'

The use of the war club is well known, and this implement, with or without a stone axe or antler inserted, was the original tomahawk. The French writers often speak of the swords of the Iroquois and others, but without any precise description. They were sometimes fastened to poles by the Algonquins and used as spears. Stones or shells were used as knives, but the white man's knife soon supplanted these; and this was the lot of the stone axe, which was not grooved among the Iroquois, nor was it usually in New York or Canada. First, the French trade axe, and then the smaller steel tomahawk, became favorites, while guns took the place of bows and arrows.

Although spear-heads present a few varieties in New York not common here in arrows, so many are essentially the same, except in size, that they will require fewer illustrations. They are quite often of fine or showy materials, and are as variable in coarseness or delicacy of work as in other ways.

Leaf shaped spear-heads are often quite large. One of common flint, from Baldwinsville, has lost half an inch from its tip, and is still nine inches long, with an extreme width of two and three quarters inches. The base is neatly rounded, and the outline that which botanists term lanceolate. This form is common and when thin may

be termed a knife. Fig. 102 from Oswego county is a fine example of this type of spear. It is of pure white flint, and six and one half inches long. Articles of this showy material are frequent there, and are usually thin and finely worked. An early trail crossed that county from Oneida lake to Lake Ontario and the St Lawrence, and the many travelers lost some fine articles on the way. Between that trail and the Hudson river very few of the best early relics occur, as the Mohawk presented few temptations to those in search of game.

Fig. 103 has a straighter base than the last, and is not as neat in outline. It is quite thick, being eleven sixteenths of an inch in the short diameter, and five and one eighth inches long. The material is grey flint, and it comes from the east side of Skaneateles lake, in the town of Spofford. Another good example of this form is from the east end of Oneida lake, and is but three and seven eighths inches in length. A broad and fine one, with a slightly concave base, from St Lawrence county, is of white quartz, quite neatly chipped for this material. It is four inches long and one and seven eighths broad.

Fig. 104 is an example of a frequent and variable form, having a three-sided base. The edges may be straight or convex, and the thickness varies much. This comes from the north shore of Oneida lake, and is of black flint, five and five eighths inches long, and half an inch thick. These could only have been spears. A fine and larger one of common drab flint, from Baldwinsville, is six and one half inches long by two and three quarters wide. This has convex edges. Flinty limestone is a frequent material for these, and one from near Oneida lake, similar in form to the last, but little over four inches long, is made of birdseye limestone. Fig. 105 is one of the finest of these, made of common flint, and is seven inches long. It is very neat and symmetrical, and the form is the one so common in New York caches, though rarely as large as this. Large spears of this outline are not rare.

Those of a more triangular form are often knives, but spears will be found among them. It will not be necessary to figure many of these, or even to describe more than representative forms. A broad and massive one of common flint, from Onondaga lake, is five inches long, and has a width of nearly two and three quarters inches. The

base is concave, with rounded angles, and the edges gracefully curve to the sharp point. One of similar length and general outline, from the same place, is little more than half this width. Fig. 106 shows a beautiful spear or knife of fine white and somewhat translucent quartz, from Oneida lake. It is so thin and even that it might well be called a knife, but it would have served for a spear quite as well. The length is four and seven eighths inches, and it is scarcely three eighths of an inch thick. The greatest breadth would have been full two inches, had not an angle of the base been broken. Another beautiful example of dark jasper, from the shores of the same lake, is nine and three eighths inches long, and two and seven eighths wide. The base is straight, and the convex sides slightly expand toward the center. A beautiful lance-head from the Oswego river, has lost half an inch from its point, but is still seven and three quarters inches long. It is one and seven eighths inches wide at the slightly curved base, whence it tapers to the point. A similar one of grey quartz, from the same place, is five inches long, and two inches wide. The straight edges taper almost to the point, which they form by quickly curved lines. Fig. 107 is a very handsome one of white mottled quartz, three and five eighths inches long, and is also from Oswego county. The base is slightly rounded, almost immediately reaching the extreme width of one and five sixteenths inches, and thence sloping in nearly straight lines to the point.

Fig. 108 is a very remarkable specimen in every way. It is a fragment of a very large spear apparently, and is very evenly chipped. The material is a dark green jasper, and the straight and sharp base is four inches wide. The thickness is but five eighths inches. Nine inches from the base, where it is broken, it is three inches wide, and if continued on the same straight lines to a sharp point, it would have been nearly or quite three feet long. It is hardly probable that this could have been. It is remarkably flat, and possibly may have been used as an axe, the base forming the cutting edge, in that case.

Stemmed forms occur, with and without notches. Fig. 109 is quite broad, and has parallel sides, slightly notched at the expanded base. The point is quite obtuse, and the full length three and three quarters inches, with an average breadth of one and five eighths inches. The

material is a brownish drab flint, and it was found south of the Oneida river. It would have served quite as well as a knife. Fig. 110 is one of the simpler forms, with rounded stem, but ruder than in some examples, partly from its material. This is white translucent quartz, which allows little opportunity for delicate work. This form is frequent in many materials, and a beautiful one of chalcedony, with slightly rounded base, and four and one eighth inches long, comes from the town of Van Buren, south of the Seneca river. It is quite broad, with convex edges, and is slightly mottled. A much larger one, of reddish brown jasper, six and one quarter inches long, and three inches wide, has a point so broad and rounded as to suggest a spade. This is from Brewerton, and is coarsely chipped, though fine in outline.

Fig. 111 is a fine beveled spear-head of drab flint, found on the Seneca river southwest of Three River Point. It is three and seven sixteenths inches long, and about one and one eighth inches broad. This is narrow for a beveled spear-head, and of course there is a possibility of its being used as a scraper. In this example there is a notch in each lateral edge and the base is slightly wider than the blade. Simple notched forms like this are frequent in many sizes and materials, but beveled implements are much rarer. Many spear-heads occur with straight sides, but these are rarely parallel. The last four figures, all on one plate, are represented three fourths of the actual diameter.

Fig. 112 is a fine notched spear-head, with a small base. It is of common flint, six inches long, and the greatest width is nearly midway, where it reaches two inches. It comes from Baldwinsville, and, like most spears, is quite symmetrical. One much like it, but of light blue flint, was found at Cross lake. This approaches the double notched form. Fig. 113 has also a small base, and one perfectly simple. It is of a grey flinty limestone, and comes from the town of Elbridge. It is a trifle over six inches long, with an extreme width of one and three quarters inches, and is very symmetrical and neatly worked.

Fig. 114 is a beautiful notched spear or knife, made of a material much resembling moss agate, and often used in these larger imple-

ments. In flaking, this does not produce as sharp lines, nor always as symmetrical forms, but the effect is often fine. This is broader than usual with this material, and is almost three and one half inches long. It comes from the Seneca river, where articles of similar material often occur.

Fig. 115 is a very slender flint spear-head from the town of Wilna, Jefferson county. It is broadly notched near the base, and is four and one quarter inches long, with a width of much less than an inch. The base is about as broad as any part, and the slender form is not rare.

Fig. 116 is much like one already described, but has double notches on each side, although of a different character from those usually found. The base contracts to a point, and the notches are widely apart. It is a fine article of light grey flint, four and one quarter inches long, and was found in Oswego county, north of Brewerton, and half a mile from Oneida lake. The double notched spears seem more common in that vicinity than elsewhere, but this specimen is not of the usual type.

Quite massive and coarse spear-heads occur in several places, usually made of a grey quartzite, unsuitable for fine work. One of these, from Baldwinsville, is quite thick, and six inches long by two and one eighth inches broad. Fig. 117 is a good example from the same place, which is five and one half inches in length. Another from Owego, in Tioga county, is five and three quarters inches long, with an extreme width of two and three eighths inches. In this, however, the blade quickly contracts above the notch, giving the implement a much more slender appearance. Articles of this kind seem quite uniform in size. Fig. 118 much resembles these in form, especially the last described, but is much smaller, and of a variegated hornstone, a little over two and one eighth inches long, but the point is slightly broken. It comes from the Oswego river.

A broad form of the material resembling moss agate has been already given. They are usually longer and more slender. One of this description is from Baldwinsville, and is five inches long. It is a very fine example, a little unsymmetrical, rather broadly notched, and might be called a knife if it were sharper. Fig. 119 is one of the

finest of these, but has lost the extreme point, having been originally a little over five inches long. It has two notches on each side, and the surface is flatter and straighter than in others of this material, while it is also more slender. It was recently plowed up near Three River Point.

These spears and arrows with more than one notch on each side are but moderately rare, and are of wide distribution in New York, as compared with other parts of the country. Dr Rau figured a broken one from Maine, made of brown jasper, whose full length would have been six and one quarter inches. He marked this as 'quite exceptional,' and it had three notches on each side. It is of the usual New York form. Dr Abbott did not place this among his New Jersey forms, nor does it appear in Mr Fowke's chipped implements of the Mississippi basin and the southern states. The writer does not find it in his collection of outlines of rare articles in Ohio. One occurs in the collection of the Canadian institute, in Toronto, which is three and one half inches long, and has double notches, but there it is also called rare, and more have come under the writer's eye in central New York, within a radius of a dozen miles, than have been reported in all the country elsewhere. It might be considered a New York form.

A broken one of white flint comes from the Seneca river, and has two distinct broad notches on each side, with others which are obscure. This fragment is now two and three quarters inches long, with straight edges, tapering from a base one and one half inches wide. The original length would have been four and one half inches, unless it had a rounded obtuse point, as in the next. Fig. 120 is a fine article from Oswego Falls, and is of greenish white flint, four and three eighths inches long. The double notches are much more distinct than in the fragment just described. One of white flint comes from the Mohawk valley, and is five inches long, with three notches on each side. Another, made of red jasper, is from Brewerton, and is three inches long, with double notches. Similar ones occur there. A well wrought one of drab flint, from the same place, is three and one half inches long, and has double notches. A smaller and broadly triangular specimen, of common flint, comes from Skaneateles lake.

It has double notches, and is two and seven eighths inches long. Fig. 134 was inadvertently placed out of its proper order, but is in every way the finest of these yet found. The material is clouded quartz, and thus the flaking produced no conspicuous lines on the surface, but the outline is very neatly wrought. It is six and one half inches long, and was found in removing a stump three quarters of a mile north of Brewerton, in 1896. It is flat and thin, and nearly two inches wide, but its prominent feature is the number of notches, five on one edge and six on the other. The base is truncate, and the edges slightly curving to the sharp point.

Fig. 121 is a good example of a thin and narrowly notched spear-head of common hornstone, quite sharp, and attenuated at the point. It is about two and five eighths inches long, and is a very frequent form. This specimen is from the Seneca river, as is the next. Fig. 122 is also of hornstone, but quite thick, and slightly shouldered. The base is long, and does not expand, but is rounded at the end. It is three and one eighth inches from extreme base to the point, and is typical of a large class, very widely distributed.

Fig. 123 is a notable spear-head from Owego, near the Susquehanna river. It is of a blue grey flint, seven and one quarter inches long, and is a very rare if not unique form. Either end might have been used for a spear, had occasion required, but apparently this was the office of the longer and slender part. This had mostly concave edges, rounding to the point. The shorter and broader portion has convex edges throughout. The whole implement is neatly wrought throughout.

Some stemmed spear-heads have concave bases; perhaps no great distinction, and yet one which has attracted attention. Many others, slender, but of the notched arrow form, are made of white flint, a favorite material for spears, but obviously brought a long distance. While fine examples they present few peculiar features. Stemmed spear-heads with a convex expanding base are also frequent, and are usually notched. Fig. 125 shows a parallel sided form from Skaneateles. It is of drab flint, two and seven eighths inches long, and one and one eighth inches wide. While it is notched, the general outline is a long pentagon. Much like this, but larger, is one from Queens-

bury. Judging from collectors' reports, fine spears may not be frequent in that part of New York. In the former Wagman collection, made at Saratoga and near Lake George, but 36 spear-heads were catalogued. The largest was six and one half by two inches, and another, six by one and one half inches, had serrate edges. This collection was sold and dispersed in 1886. In Holden's *History of the town of Queensbury*, however, we are told that arrows, spears, and other indian relics are found at every carrying place between Albany and Montreal, and this we might have expected. Mr Holden adds that while gun flints, bullets, stone arrows and spears were spread broadcast in Queensbury, there were particular places where they were found abundantly.

Out of the many examples of spear-heads but one more will be noted now. Fig. 124 is a broad and thin chalcedony implement from Baldwinsville. It is triangular, with an indented base and convex edges. The length is four and one eighth inches, and it is a little over two inches wide. One peculiarity of this fine article is the neat and small notches, which are almost circular.

KNIVES

The ruder forms of knives require but slight attention, as almost any flake or piece of hornstone might serve a temporary purpose, whether large or small. Early accounts show us an extensive use of bivalve shells, with or without alteration. Few of these can be found now, but the rude stone knives are abundant in many places, and are interesting as showing, not so much progress in economic arts, as the frequent utilizing of otherwise waste material. A flint chip was neatly edged on one side, or more, and did all that was required without farther elaboration. Fig. 126 is the type of many rather large and straight pieces, triangular in section, which were often used as knives, and might have served for scrapers. One angle or edge is left without farther work, but one or both of the other two may be delicately chipped for more effective use. Of course these could have been employed only in very simple ways. This one is of grey flint, and comes from Seneca river, where the form is frequent on many camp sites. The length of this specimen is three and one quarter inches, and one angle is quite obtuse.

Many rude knives, large and small, were nearly circular, and these also will require but slight notice. They are chipped to a sharp edge all around, and may sometimes have served as scrapers, although they do not have their peculiar features. The leaf shape is also very common and of wide distribution, varying from very small to very large. A very long one of brown flinty limestone, seven inches in length, has a surface greatly curved, being convex on one side, and concave on the other. The concave surface is a large single flake, except for the chipping along the edge. This special form is not rare, and is almost as much scraper as knife. The one described is two and one half inches wide. Another of dark hornstone, from Oswego Falls, is a typical leaf-shaped knife, five and one half inches long by two inches broad.

Fig. 127 is interesting, as being one of 23 found in the mound at Greene, Chenango county. It is of yellow jasper, three and three quarters inches long and two inches wide, and may have been buried there long after the mound was made. In the *Annals of Binghamton*, it is stated that 'At one point in the mound a large number, perhaps two hundred arrow-heads, were discovered, collected in a heap. They were of the usual form, and of yellow or black flint. Another pile of 60 or more, was found in another place in the same mound. A smaller leaf-shaped knife of yellow jasper, two and three quarters inches long, also came from a grave in Greene, as reported, but may also have been from this mound, so many articles of yellow jasper having been taken from it.

A very large and rude knife, seven and one quarter inches long, also came from a cache of 19 pieces at Baldwinsville. It was an unusually rough and mixed lot, nearly all of yellowish jasper, tinged with brown. Most of the pieces had the form usual in caches, but some were of ruder outlines, and a few could only have been utilized as scrapers.

Knives which are elliptical, or of a long diamond form, pointed at both ends, are often very fine, and are by no means rare. Fig. 128 is of drab flint, four inches long, and more slender and pointed than many of this form, besides being more angular in the center. It is quite neatly worked. A fine one of yellow jasper, from the Oneida

river, is almost a true ellipse, five inches long by two and three eighths inches broad. It is scarcely pointed, and many have this feature in other forms. A small one of common flint, which is but two inches long, differs little from fig. 128 except in size. Fig. 129 is a beautiful knife of light blue flint, five inches long. It is not a rare form, but with this outline is quite as often a scraper as a knife. Nothing can be prettier than fig. 130 which is of a beautiful banded white flint, three inches long. It comes from the town of Van Buren, some miles south of the Seneca river. Among the finest of this form is a very long and slender one from Chautauqua county. It is $11\frac{1}{2}$ inches long, two and three quarters inches wide, and about a quarter of an inch thick near the two sharp points. The edges present so symmetrical a curve that the outline may be reproduced from these measurements. It was a surface find.

Three small elliptical flint knives are represented by the following numbers, all from Seneca river. These are commonly less than two inches long, but may reach seven inches. Fig. 131 is one of the small specimens, made of common flint. It is one and five eighths inches long. Fig. 132 is of similar outline, but made of dark blue flint, and of the same length. It is a neater article. Fig. 133, of grey limestone, is more slender, and is pointed. The point and part of the edges are slightly ground. It is two inches long. Specimens like these were once quite frequent.

Many stone knives approach what we call a knife form, and vary much in size. One of brown flint, four and three eighths inches long, is but moderately curved in its outline, while others are conspicuously so. A black flint knife, three and one half inches long, found on the Oswego river, is very distinctly curved in this way. Fig. 135 is of this curved form, and is quite thin and sharp. It seems to have had a straighter part of some length, for insertion in a handle. This has been partly broken off, but the remainder of the implement is still three and one quarter inches long. It is of brown flint, and comes from the Seneca river. Evans described some curved knives in Great Britain, much like these, and thought them peculiar to that land, but could assign no use for them. They seem well adapted for several purposes, but their very form suggests the knife, alike available in war or hunting.

Fig. 136 is somewhat like the last, and from the same river. It is much thicker, and not unlike some of the curious scrapers yet to be described. It is of brown flint, three and one quarter inches long, and somewhat twisted. Several have this feature. Fig. 137 is curiously curved, but is typical of quite a group. It is of brownish flint, three and five eighths inches long, and comes from the east side of Skaneateles lake. The general thickness is considerable, but the back of what might be called the handle is not sharpened, as is the rest of the implement. Another curved and twisted knife of common flint is six and one quarter inches long. All of this type vary much in thickness and neatness of work. Fig. 138 may be classed with these, though with quite a different outline. One edge is nearly straight, and the other much curved, the surface is also much curved, being concave on one side, and rounded on the other. It is of brownish flint, two and one half inches long, and comes from the Oswego river.

Some of the most delicate knives have straight bases and curving sides, the blade being broadest toward the point. Fig. 139 is one of these, of brown flint, delicately worked, and three inches long. This is from the Oswego river, and is typical of many others, always neatly finished, but often broken. Another from Three River Point is of yellow jasper, four and one eighth inches long. This is also a fine example. A longer and neatly worked specimen, made of brown flint, and five inches long, is from the east end of Oneida lake. Evans called a similar form in Great Britain a dagger, and it readily suggests that weapon, though usually rather frail for any rough usage.

Another frequent form of knife in some places is thin, parallel sided, and broken squarely off at each end, as though by design. They are somewhat local, and on many sites are never found. Fig. 141 represents one of these, of common flint, thin and bent, and two and three quarters inches long. This is from the Seneca river, where almost all have been found on two or three sites. One from Queensbury, three and one quarter inches long, seems much like these.

Triangular forms, with straight or convex sides, are common, and hardly require illustration. They vary much in width and thickness, and reach five inches in length, but are usually less. They are often curved on the surface, and are sometimes quite broad. Fig. 142 is

one out of a number of narrow knives of this form, all found on one small site on the Seneca river. They varied from three to four and one half inches in length, and were very thin and sharp. From their numbers and uniform character, it is probable they were scattered from a cache. The one figured is four and one half inches long, and one and one eighth inches broad. One of the finest of this form is of striped jasper, five inches long, and comes from Oneida lake. This, however, has curving edges, and is broadest near the center. A broader form than that last figured, appeared in a lot of 125 like specimens in a grave in Bellona, near Seneca lake. A few are nearly long, straight sided triangles. Some knives have the simple pentagonal form, so common in caches, and these are sometimes bent. This peculiarity is frequent in notched forms, usually classed as knives because of this. Fig. 146 shows an arrow form thus bent. In one instance a broad notched form from Oswego Falls, three inches long, has a distinct double curve of the surface. Other notched forms, and some of the simpler, may not have an equilateral blade.

Fig. 143 is a fine knife of grey limestone from Cross lake, much like the Queensbury knife just mentioned. It is truncate at each end, three and five eighths inches long, one and one quarter inches broad in the middle, where it is widest, and is somewhat thick. Fig. 140 is a small, slender knife, approaching the drill form, if not an implement of that kind. It is of variegated flint, two inches long, and comes from Seneca river. Fig. 144 is a coarse and heavy curved knife of hornstone, from Onondaga lake. It is five inches long and two and one quarter broad, with nearly parallel edges. This is quite a frequent form. Fig. 145 is the ordinary leaf-shaped knife found almost everywhere. This is of common flint, three and one half inches long. In other examples it would vary in size, length or breadth, ranging from broad to narrow, and similar differences will be observed in every form here represented.

SPADES OR HOES

Spades are of very uncertain character, and some articles possibly used as such might be considered spears, knives, or even rude celts. Few are found that we can call spades and nothing more. The early

visitors had little use for those of stone here, as they came for hunting and fishing, and not to till the soil. The Iroquois, who were an agricultural people, used stone as little as possible, and made their hoes and digging tools of wood or bone; mostly the former. In Bruyas' *Mohawk lexicon*, about two centuries old, *onarate* is the wooden hoe, but there is no word for spade, which they would only use in digging post-holes, or pits for caches, where the hoe would be quite as serviceable. In the early book called *New England prospect*, it is said that part of the women's work was 'their planting of corne, wherein they excede our English husband-men, keeping it so clear with their clamme shell-hooes, as if it were a garden rather than a corne-field.' Loskiel said of the cultivation of corn 'They used formerly the shoulder blade of a deer, or a tortoise-shell, sharpened upon a stone, and fastened to a thick stick, instead of a hoe.' In Van der Donck's *New Netherlands* are interesting notes on points connected with indian agriculture, although their implements are not described. 'They say that their corn and beans were received from the southern indians, who received their seed from a people who resided still further south, which may well be true. . . The maize may have been among the indians in the warm climate long ago; however, our indians say that they did eat roots and the bark of trees instead of bread, before the introduction of indian corn, or maize.' They had beans before the whites came, and 'have a peculiar way of planting them, which our people have learned to practise: when the Turkish wheat, or as it is called, maize, is half a foot above the ground, they plant the beans around it, and let them grow together. The coarse stalk serves as a bean prop, and the beans run upon it.' The Onondagas have a pretty story about this.

In the fall they burned over the places which they wished to plant the next spring. There are many accounts of the large caches in which they kept their corn, and these are yet found in many places, while the corn itself is often plowed up. One piece of woodland in Montgomery county is full of the open pits, but the Iroquois also stored corn in boxes made of bark, and sometimes had vast amounts of this. The cache method, however, was very common, and in the pits both corn and beans were stored. In his early account of the

Mohawks, the Rev. Johannes Megapolensis says, 'When their corn is ripe, they take off the ears and put them in deep pits, and preserve them therein the whole winter.' A fuller account will be found in the *New England prospect*. 'Their corn being ripe, they gather it, and drying it hard in the sunne, convey it to their barnes, which be great holes digged in the ground in forme of a brasse pot, seeled with rinds of trees, wherein they put their corne.'

The origin of indian corn is a question of much interest, and a great deal has been written upon it. Besides what has been said above, Roger Williams gave the New England tradition: 'The crow brought them at first an indian grain of corne in one eare, and an indian or French beane in another, from the great god Kautántouwit's field in the southwest, from whence they hold came all their corne and beanes.' Corn hills were large, and stood well apart. They are still to be seen in some New York woods, and the cultivation was very simple. Roger Williams has a note on what he thought a curious preference in tools: 'The indian women, to this day, (notwithstanding our howes,) doe use their naturall howes of shells and wood.' Spades are not mentioned, and, bearing this fact in mind, it is quite likely that those stone implements of New York which resemble what are called spades elsewhere, are to be considered hoes, if they were really digging tools. The question admits of reasonable doubt, but the classification may be allowed for present convenience. It may be added that less was needful for digging than is often supposed. In an emergency the writer has been surprised to see how much excavating he could do on an indian site with a sharp stick, or a broad and pointed stone. With improvised tools and plenty of muscle a great deal could be easily accomplished, but the necessity for this was so rare in indian life that little faith need be placed in the New York stone spade.

Fig. 147 represents the finest of these articles known to the writer. It is a leaf-shaped implement of a bluish grey stone, and came from Oneida lake, where it was plowed up in 1877. The average thickness is three eighths of an inch, and the length is $11\frac{1}{4}$ inches, with a breadth of five and one quarter inches. This and the two following figures are reduced to about two thirds of the actual size. It is sharpest at the broad end. This article seems much too large for either spear or

knife, though both these have been found quite as long, and it may be best to consider it a digging implement for the present. Smaller specimens are common, with a similar outline. An elliptical one of drab flint, five and three quarters inches long, also came from Oneida lake. Another, with straighter sides, is from Brewerton, at the foot of the same sheet of water. This is of grey flint, and is seven and three eighths inches long, and three and one half inches wide. This would be called a knife but for its size. It is not equilateral, but while one of the lateral edges is straight, the other is longer, and curves gradually to meet it at the point. Quite a number are between five and six inches long, coming from several places.

Two fine leaf-shaped implements from the Susquehanna river should be mentioned. One is from Nichols, and measures $10\frac{1}{2}$ by six inches. It was found 25 years ago. The other is from Owego, and is a little smaller, being 10 inches long by four and three eighths wide. It is of a light translucent flint, and was found 50 years ago, just below the Susquehanna river bridge.

A different form of flint implement was certainly used for digging, although in a very moderate way. The form was often that of a shouldered spear, but with the point rounded and polished by contact with the earth. Fig. 149 is a good example from the Seneca river, made of grey flint, and four inches long. Fig. 148 is another of common flint, found near Rome, N. Y. This has no shoulder, and may also have been used as a knife, but the narrow point is highly polished by use. It is three and one quarter inches long. It is quite probable that this was a secondary use; a broken point being re-chipped, and then used in this way. It is even more likely that spears and knives were sometimes used in digging.

Fig. 150 is a pointed leaf-shaped implement, which one hesitates to call either spade or hoe, so handsome is the material and so fine the work. It is a fine orange jasper, five inches long and nearly three and one half inches wide. It was found on Onondaga lake, where others of less beauty occur. This figure and the following two are reduced to three fourths of the actual size. Others, of the same general shape as the last, are less pointed.

Some broad, thin, and celt-like chipped sandstones are often now classed as spades, and occur on some village sites. They would do

moderately well in digging, though a sensible savage might have much preferred a sharp stick, horn, or bone. As hoes they would have been more useful, and this may have been their office. They range from four to seven inches in length, with a proportionate width of more than half, and have a wide distribution. Fig. 151 will suffice as an example of these. It is of red sandstone, having parallel edges and rounded angles. It is chipped much like the flat net sinkers, but has no notches. The length is five and seven eighths inches, width three and three eighths, and thickness five eighths of an inch. This is from a village site on the Seneca river, where many were found. On some smaller sites they also occur, while on others they are altogether lacking. It may be added that the nature of these sites does not favor the theory that they were used in agriculture.

CHIPPED STONE AXES

Grooved axes are rare in New York and Canada, and probably were never used by the Huron-Iroquois family. Chipped implements of an axe-like form are no more plentiful in New York, while the common celt, or polished stone axe, without grooves, is both abundant and variable. These were used by the Iroquois, even after white contact. Although iron axes quickly came into use, yet Champlain said that the Mohawks were not well supplied with these in 1609, and some still employed the primitive axe of stone. Fig. 152 shows a rudely notched implement of brown sandstone, from Oswego Falls, much like a modern hatchet in outline. It is five and five eighths inches long, and is quite flat. This is an unusual form, although other rude implements have some resemblance to it. A much neater and more regularly chipped axe of the same material, is from Brewerton. It is five inches long, with a width of two and seven eighths inches towards the cutting edge, and one and one half inches at the top. The lateral edges are straight. Fig. 153 represents a fine article of ferruginous flint, somewhat square, and five and one eighth inches long by about three and three quarters wide. It comes from the Oneida river, and is of moderate thickness. There can be no doubt that it was used as an axe.

Chipped celts were quite abundant almost everywhere, and were sometimes a final, sometimes a transitional form. The usual course

was to chip the stone into the shape of the celt, when this could be done. This might go no farther, for as a weapon of war it was already serviceable, and perhaps in some of the arts of peace. If the material was fine, it might afterwards be picked and polished. Often the edge was ground before these things were done. The finish has nothing to do with the age, for the rudest and most finished forms may be found, side by side, on the same village site. Many show all three processes in the unfinished implement. The work might go on for years, at intervals, the weapon being used nearly all the time. As the difference is thus only one of finish, except in flint celts, no illustrations need be given of those of common stone.

A micaceous stone is frequent on a few sites, showing no signs of work, but presenting such resemblances to finished celts that one can hardly doubt its use. It would soon lose all marks of human skill.

In the examination of Iroquois sites, one can hardly fail to observe how the stone age was on the wane, in this family at least. With rare exceptions stone implements were rude, and there was neither the variety nor beauty in articles of stone everywhere seen among their New York predecessors. Bird amulets, gorgets, stone tubes, scrapers, drills, and banner-stones were already things of the past. Arrows were small, comparatively few, and mostly of one form. Stones were still used in grinding corn and cracking nuts, but the wooden pestle and mortar had their established place among prosperous people. Stone vessels were forgotten, and bone and horn took the place of flint. Still, stone was necessary, and the ungrooved axe was often finely finished.

There are a few chipped celts of flint, often ground at the edge, but ground flint is rare in this country. Fig. 154 is a good example, coming from Onondaga lake. It is of common hornstone, two and three quarters inches long, seven eighths wide, and five eighths of an inch thick. It is ground to a moderately sharp edge at both ends. A broad edged one of chalcedony, three and five eighths inches long, comes from Oswego Falls. Fig. 155 is of grey flint, two inches long, one inch wide, and nine sixteenths thick. The cutting edge is neatly chipped, and one surface is much flatter than the other. This is from Onondaga lake. A much larger one of grey flint, comes from the

town of Marcy. This is eight and three eighths inches long. Fig. 156 is a well marked form. In this most of the surface is flat, the cutting edge being sharply beveled on each side. It is of drab flint, two and one quarter inches long, and five eighths of an inch thick. It comes from Seneca river. Another finely chipped celt is from near Skaneateles lake, and is represented by fig. 159. It is of brown flint, over an inch thick, and sharpened at both ends. The length is nearly four inches, and it is symmetrical throughout. Fig. 160 is of common hornstone, with parallel sides and rounded edge. It is from Cross lake, and is two and one half inches long, one and one eighth wide, and three quarters of an inch thick. It is very neatly chipped. Fig. 161 is of unusual material, being of clouded quartz, well worked. It is two inches wide, and two and seven eighths long. This is from Onondaga lake. Others might be described, but there is no great variation in form. Only a few are elliptic, but several have the wide and ground edge. Although rare, they are widely distributed, and are sometimes of choice material.

An earthwork in the town of Granby has no relics beyond small fragments of earthenware, a few flint flakes, a flat sinker, and one or two skeletons, but a rude celt of greenstone, seven and one quarter inches long, was found quite near. The indications are that its occupation was very brief. An earthwork, three miles southeast of Baldwinsville, has fine celts, but many more which are very rude, varying from three and one half to nine inches in length. One of the latter length is massive, prominently ridged on one side, and but little worked. Another of talc, four inches long, and laterally curved, is rudely chipped, but is remarkable for form and material. Some of these rough celts are a broad ellipse. The only earthwork in Wayne county furnished a rude one of dark crystalline stone, nine and one eighth inches long. Numberless examples might be given.

PERFORATORS

Among the most remarkable and perplexing articles of flint are those known as perforators or drills. They are widely distributed, and are of a comparatively early date, in New York at least, not having been used by the Iroquois, who preferred awls of horn or

bone. Some are found in Great Britain, but of simple forms and rude workmanship. Dr Abbott well said of these, and some other things, 'It is certain that the majority of our specimens, such as scrapers, drilling stones, etc., are manufactured with greater elegance, and evince a more thorough knowledge of the chipping art. The English specimens appear to be all flakes, which have had the edges chipped, that the required shape might be given to the specimen.' Ours are usually worked over the entire surface, but not invariably, for we have specimens as rude as any in England.

In some places perforators are rare, and but six were catalogued in the Wagman collection at Saratoga. Out of 327 in Mr Douglass' collection, but 29 are credited to New York, where they really are abundant.

So slight is the division between these and arrow-heads, in very many cases, that it has recently been suggested that they are but a slender form of these. Sometimes it is a question to which class to assign some forms. A series of triangular arrows from one site, commencing with a broad form, grades insensibly into those so slender that they would be called drills anywhere else. The main difficulty, however, is to assign them a distinct use. They fit well in the spiral perforations of gorgets, but no great length would have been required for these. Possibly they may have been used in perforating wood, but this is doubtful. For piercing leather a sharp bone or thorn would have been preferable. An early writer, in speaking of shell beads, said they were drilled with a nail or a sharp stone. We might suppose that their use was of this nature, were it not for their abundance in places where large shell beads were not likely to be made. Their fragile character and few signs of use, increase the difficulties of the problem. Some, therefore, have suggested that many were pins, more or less ornamental. Dr Rau thought some of the straight, double pointed forms might have been used in fishing, the line being attached in the center, according to a well known method. The question can not be satisfactorily discussed now.

Long straight perforators or drills, for the common name will be used here, are quite common, and are usually of grey, drab, or black flint, often expanding at the base. They suggest awls or bodkins, at

once. Fig. 157 is such an article, of common flint, representing a frequent form on the Seneca river. It is three inches long, and the base is but slightly wider than the main part. One of the same form and material but four inches long, comes from Onondaga Valley. This also is straight, and has but a trifling expansion at the end. Another of similar form and material, from Brewerton, is a little thicker, and three and five eighths inches long; nor are these solitary examples, although they may represent the extreme length of this form here.

Some expanded forms do not exceed an inch in length. Fig. 158 shows one of these which is not an inch long, but which is neatly worked and symmetrical. It is of bluish flint, and was found at Baldwinsville in 1878. Fig. 162 has a thicker base than usual, and indeed is somewhat massive throughout. It is of brown flint, three and three quarters inches long, and comes from the Oswego river. Fig. 163 is a beautiful drill, yellow at the base and shading into red, which is the color most of the way towards the point. This may have been caused by heat. The base is moderately broad with concave sides, and is three and three quarters inches long. It comes from Onondaga lake. In many such forms there is little more than a quick expansion of the base, tapering, rounded, or angular, as the case may be. These vary little in length, but are often quite wide. Fig. 164 unites the scraper and drill, as in some other cases, having a scraper edge almost to the point. It is of mottled flint, two and one half inches long, and was found on the Seneca river.

Another form of the long drills was distinctly notched. Fig. 165 is a beautiful example of these. It is from the same river, and is of a mottled grey flint, three and seven eighths inches long. Both work and material are fine, and it is slightly barbed on one side. Very closely resembling this is another from the Mohawk, at Canajoharie flats. It is of drab flint, a little shorter and wider than the last, but equally fine. The length is three and three eighths inches. A broader form still, but of about half the length, comes from Brewerton, and there are many approaching these.

Excepting as they approach the triangular form, those with a very long and broad base rarely reach two inches in length. Fig. 166 is

very odd, the broad and notched base having elevated points on either side. It is from the Seneca river, and is of light brown flint, one and three eighths inches long. Fig. 167 is a frequent form, with a broad and deep base, which in some may be widest above or below. Sometimes the contraction above the base is very moderate at first. This is of common flint, and is one and one quarter inches in length. It is one of the frequent forms. Fig. 168 is one of the largest and oddest of this variety, and comes from Brewerton. It is of brown flint, and the broad and curving base has obtuse raised points, strongly suggestive of those in a drill already figured. The length is two inches, and it is nearly as broad.

Some of these expanding bases suggest the gimlet and thumb-screw, and might have been used with or without an additional handle, but the straight and slender ones, if used for perforating, would have required a handle of some kind. Fig. 169 is a small example of the thumb-screw pattern, the three arms being much alike, though one is a little longer and narrower than the others. It is of drab flint, one and one eighth inches long, and could be easily turned by the fingers. This is from Seneca river, and another from Brewerton, two inches long, presents the same concave base. This is carried still farther in fig. 170, a specimen unfortunately broken, where the wide base is almost as slender as the shaft. One prong terminates in a notched and rounded point, as if for suspension, and it is a question whether the broken part had the same feature, as is probable, or whether it was a double pointed drill. It is of black flint, two and one half inches long, and comes from the Seneca river. A smaller one, somewhat like this but with a narrower base, was found on the Canajoharie flats. The one figured, however, is unique in some respects.

Fig. 171 is a good example of the gimlet form from Onondaga lake. It is of grey flint, two and one half inches long, and very symmetrical. One from Geneva is almost equally so, and is two inches in length. This form is rarely perfect, from its great liability to injury, but more might be described. Among those having deeper expanded bases is one of rosy quartz, one and three quarters inches long. This is also from Geneva, where many small forms have been found. There are

one sided basal drills, and those oddly curved, but these seem mere freaks, and but one will now be mentioned, because some have thought it may have been used in forming a primitive fish-hook, by binding it to a perforated stick. Dr Rau (see *Prehistoric fishing*, fig. 180) shows one closely resembling this in a Greenland hook of wood and stone. Capt. John Smith speaks of a similar use of bone in Virginia. 'Their hookes are either a bone grated, as they noch their arrowes in the forme of a crooked pinne or fish-hooke, or of the splinter of a bone tyed to the clift of a little sticke, and with the end of the line they tie on the bait.' That this article is well adapted for such use will be readily seen, and Dr Rau's figure seems almost conclusive proof.

Occasionally a drill is widened in the middle, between the base and point. Very simple examples of these occur, but sometimes they are rather curious. Fig. 173 is a flat form of drab flint, one and one half inches long, and might be described as a double thumb-screw. While the center has been well preserved, both points have been broken off, but they were evidently quite short when perfect, so that the figure presents very nearly the original outline. Even now it is a most interesting article. Fig. 174 is another odd form, very wide, and deeply notched. Above the notches it might be described as broadly winged, but the barbs form its most distinctive feature. It is of drab flint, one and one quarter inches long, and was found not far from Rome, N. Y.

Many drills are nearly triangular, and occasionally one may have been formed from an arrow-head. Fig. 175 may have had such a primary use, followed by a moderate narrowing of the point. It is notched, of dark flint, one and seven eighths inches long, and was found near Three River Point. Fig. 176 is a straight perforator of common hornstone, two and five eighths inches length. The base is better finished than in most examples of this variety, which are often smaller, and of black flint. This comes from Onondaga lake, where many of this form have been found.

Sometimes one occurs, straight and uniform, which has a rounded point at each end. These grade into a broader form, which seems a small knife. A few have an erratic form, marked by a one sided

base. Some convex sided arrow-heads, as has been said, are drawn out into a slender point, suggesting a perforator, and there are rude specimens, perhaps used for temporary purposes. One of these forms, not rare, is a slender splinter of hornstone, triangular in section, and chipped so as to present three faces on the shaft. In such cases the base is sometimes left unaltered.

While perforators are widely distributed, from the Atlantic to the Pacific, their most ornamental development seems to have been in Missouri, where they grade into animal forms. This gives countenance to the idea that some may have been used merely as ornaments, a remark which will not apply to all.

SCRAPERS

The typical scraper has one flattened side, usually formed by one or two broad flakings; and another, more or less elevated or ridged, which is beveled down to the other surface. It is often combined with the knife or drill, especially in implements approaching the leaf shape, or in distinctly curved knives. Scrapers are often very rude, some being made of flat pieces of hornstone, merely chipped down to a scraper edge. Sometimes other flat siliceous stones were utilized in the same way, resulting in rude and unusually large implements of this kind. Many were made of broken arrows, in which case the under surface may be quite delicately chipped. This secondary use may be the reason why they were so long overlooked here, as they were not attractive articles to collect until their true nature was known.

Many of them may have been used in handles, as in comparatively recent times elsewhere, but others were so large as not to require these. Carved handles of horn or bone have been occasionally found, but these may have belonged to other implements, as they came from Iroquoian sites, and that great family knew little of stone scrapers or perforators. Absence of such handles in other places, however, proves nothing, as horn or bone articles quickly decayed except in fireplaces and refuse heaps. It is still more likely, in a forest land, that handles would have been made of wood. Small scrapers would often require handles of some kind, but the larger ones might not.

They vary greatly in form and finish, and some very closely resemble those yet used by the Eskimo. They form a very widely spread class of implements, often adapted to local needs.

The ruder scrapers need not be illustrated now, as they took almost any form, like the ruder knives, presenting nothing characteristic except the beveled edge and flat under surface. A chance flake, or a flat pebble might be otherwise unaltered. Some are extremely small, being less than half an inch long, while others are quite massive. Fig. 178 is a fine example of a simple and large form from the Seneca river. The material is brown flint, two and five eighths inches long. This is boldly but neatly flaked, and is more massive and uniform in thickness than usual, as well as flatter on the under side. Another from Onondaga lake, of mottled flint and one and seven eighths inches long, is very much like this, but the under surface is somewhat curved and twisted, and the implement is proportionally broader. One of yellow jasper, from Oswego Falls, closely resembles this in size and character. A fragment of a large one from the Seneca river, is still two and three quarters by three and one quarter inches, but is of a ruder type. A very neat and depressed scraper, almost of a horse-shoe form, was found in the town of Marcy, north of the Mohawk river. It is of drab flint, and is three and one quarter inches in length.

Fig. 183 is given on account of its small size, although typical of quite a class. There is a small site on the bank of the inlet of Onondaga lake, which was a frequent camping place in early days, sometimes apparently occupied for months at a time. Bone harpoons, pottery, flint and bone articles, the so-called spades, and other things occur there. In excavating an ash-bed there this little scraper was found. It is of common flint, ridged in the center, and but seven sixteenths of an inch long. Another, but five eighths of an inch in length, comes from Seneca county.

Fig. 177 is a very curious article, not a typical scraper, and yet probably used for one of its purposes, that of fashioning the shafts of arrows. It seems to have been made from a broken arrow-head, and was found in 1889 in a cache in Cayuga county. The cache contained also twenty arrows and the same number of flint knives, a quantity of mica, some antler prongs, paint, and other things. Also a turtle

totem of grey stone. One of the arrows was translucent, and another was of white quartz. The remainder of the arrows and all the knives were of native hornstone. The writer has seen a similar article from Missouri, and supposes it to have been used in scraping the shafts of arrows in the speediest way.

Fig. 179 has one end rounded, and the other straight. The edges are somewhat parallel, but the surface is widest along the center. These opposite edges are beveled from opposite surfaces, so that there are one or two scraping edges, whichever way it may be turned. It is probable that some of the beveled arrows, so called, were scrapers of this kind. Part of the length has been lost, so that no scraper now appears at that end, if indeed there was ever any there, for in that part the edges become sharp, and probably the knife and scraper were combined. It comes from the Seneca river, and is made of brown flint, still two and seven eighths inches long. A smaller one of these has much the same character; the base and edge being beveled on one side, with the other edge beveled from the other surface. It is of light drab flint, one and three quarters inches long, and does not have the knife edge of the last mentioned. This was from Three River Point. Another similar scraper, of light grey flint, has four beveled edges on one side, nearly parallel, and is one and three quarters inches long.

Some which have been called gambling flints, are small and nearly square. They are not all distinctly scrapers, and seem to have been Iroquois gun flints, made by themselves for an emergency. The beveling is from both sides, as in a knife. As some of these were certainly made at a time when the Iroquois used deer buttons and peach stones for gambling, and as most of them were associated with European articles, they may well be classed as indian gun flints. Fig. 180 is one of these from the Seneca river. It is of dark flint, nearly an inch square. The square center is flat, and the stone is beveled to the edge on each side. Fig. 181 shows a Cayuga specimen, to which the name of gambling flint has been distinctly given. It is of hornstone, and was found, with 20 others, in a grave well supplied with European articles. This is an inch across, but others were smaller. A gun, bullets, and two gun flints, were among the

articles accompanying these. Fig. 182 is a smaller one from the same grave.

It will be remembered that the proper name of the Mohawks was Kaniengas, People of the flint, and that their proper symbol was a steel and flint; often only the former. Their associations were not so much with the flint as material for arrows. From almost the first they connected with it its fire producing powers. As soon as they had guns — and they were the earliest New York indians to possess them — they saw occasional economy in the use of their favorite stone. On this point there is a curious passage in the *Jesuit relations* of 1668, of an incident which happened when the French missionaries were about two miles north of Ticonderoga. 'We all stopped in this place, without knowing the cause of it, until we saw our savages gathering upon the edge of the water, gun flints, all nearly shaped. We gave this not much thought at the time, but afterwards learned the mystery, for our Iroquois told us that they never fail to stop in this place, to render homage to a nation of invisible men, who dwell there in the depth of the water, and are occupied in preparing gun flints, nearly all ready for the passers by, provided they do their devoirs in presenting them tobacco; if they give much of it they make them a large largess of these stones.' These men were farther described, but the French concluded that, in storms, 'when the wind comes across the lake, it casts upon this shore a quantity of stones, hard and fit to strike fire.' This sufficiently shows that the Iroquois often provided their own gun flints, instead of using those imported by traders.

Many scrapers are almost or quite elliptical, and some circular forms may be gun flints. Fig. 184 is a fine example of the former class from Brewerton. It is of drab flint, thin and flat, and the edges are beveled all around from one surface. It is one and three eighths inches in length. One much like this is from Auburn, and is one and five eighths inches long. It is by no means a rare form, but grades into knives.

A heavy, rounded, triangular scraper from Oswego Falls, has a double curve in the long section, and is one and one half inches long. Another of similar outline is from Cross lake. It is, however, uniform in thickness, with edges abruptly beveled in opposite directions,

forming a double scraper, which is not a rare feature. The length is but one inch. A handsome one of brownish, banded flint, one and one eighth inches long, comes from Baldwinsville. Fig. 185 represents this. It is of uniform thickness, a quarter of an inch, but is peculiar in having a concave and convex surface, with the scraper edge beveled from the former to the latter.

Fig. 186 is a long, leaf-shaped scraper or knife of brown flint, found near the rifts south of Three River Point. It is five and one half inches long, and suggests a long knife, but has but one or two long flakings on the under surface, to meet which there is the usual bevel nearly all around. It is moderately thin, and very much twisted. Several of this form and size occur, with many variations, and nearly all would serve for knives almost as well as scrapers, although having the characteristics of the latter.

Fig. 187 shows one of the finest scrapers, in material and form almost identical with some knives, except in the edge. It is of lustrous brownish grey flint, four and one eighth inches long, and widest in the middle, whence it tapers almost to a point at either end. This was found at Onondaga lake. The greatest width is one inch, and it is less than half that in thickness.

Quartz scrapers are rare in New York. One from Brewerton, one and three eighths inches in length, is triangular, and like others with that outline, is much the thickest at the broad scraper end. Fine leaf or rather often triangular forms, however, occur in common or light grey flints. Fig. 188 is one of these from the Seneca river, which is of dark blue flint, two inches long, and very evenly beveled around and near the end. The lateral edges are sharp, as though intended for cutting, and as it might have been used without a handle, if desired, it probably combined two implements, as was so frequently the case. Scrapers of this form are usually thin and flat, but are a little thicker at the broad end, and are also neatly chipped on the lower surface. Many are much smaller than this specimen, and some have the point turned to one side.

Among other remarkable scrapers are some from Canajoharie, found along the river bank. Fig. 189 represents a long form of these. They are not many in number, and have been reported

nowhere else. They vary from almost triangular to nearly circular. This one is of common flint, with conspicuous but obtuse serrations at the broad end, and is one and one half inches long. Some others there are much more finely and sharply serrate, but this serration is along one of the longer sides. They probably had some local use.

A very remarkable class of scrapers, combining the knife with these, occurs in but very moderate numbers, and somewhat local at that. They may be nearly straight, or very much curved, and there is usually a tang at the base, resembling a handle, drawn out into a shoulder on each side. They are quite likely to have been used in fashioning bows and arrows, for which the combination of a convex knife with a concave scraper admirably fitted them. Perhaps less than a dozen have been found in New York. Fig. 190 is a perfect example from the Seneca river, made of brown and drab flint, and three inches long. This is the typical form, much like that of a curved sword with its cross hilt. One much more curved, but unfortunately a little broken, is from Brewerton. It is of common hornstone, two and one half inches long, and has the deepest curve of any yet reported. Out of several which do not essentially differ from these, may be mentioned one of a gritty brown flint, which is one and one eighth inches long. Fig. 191 represents this, which came from the Oswego river. At the point there is a knob-like expansion. A very odd one comes from Cross lake, and is made of a light grey flint, one and seven eighths inches long. It is more angular than others, but the blade does not present so decided a curve. In others the scraper edge is quite as decidedly developed, and they grade into nearly straight forms with the same features. In all the concave edge of the blade is quite thick, while the convex edge is comparatively thin and sharp. In the supplement to his illustrations of the Smithsonian collections, Dr Rau figured a fine example from Ohio, about two inches long, but they are not described by Abbott among New Jersey articles, or by Fowke among those farther west and south. None have been reported in Canada, and they seem practically a New York implement, local even there. The advantage of the combination and the peculiar form will be readily seen.

A still rarer form, in fact quite unique, is one which did not return from a scientific mission, greatly to the owner's sorrow. Fig. 192 is

of dark green jasper, and was found on a small camp site on the Seneca river. It is broadly flaked, and the upper end is notched as if for suspension. The remarkable features, however, are the angular central projection of the broad scraper end, and its continuance on either side beyond the lateral lines. The length is one and seven eighths inches. It is greatly to be desired that this unique article should be recovered, from its local and general value. For the present the finder can only depend on his record and figure. Notches, apparently for suspension, are sometimes found in these and other articles.

Stemmed scrapers often have the outlines of arrows, and are distinguished only by the edge. Some were made from broken arrow-heads, and these are readily identified by the under surface. Fig. 193 is like the long-stemmed bunts, but is a true scraper, somewhat coarsely chipped. This variety has been described in New Jersey and elsewhere. The material is a grey flinty limestone, two inches long, which is larger than the ordinary size. A long and ruder one, however, also from the Seneca river, is three and one quarter inches in length. It is quite thick, and has an unusually long stem.

Others of this general form have a slightly expanded base, as in the bunts. Fig. 194 is a good example of these, of brown flint, one and one eighth inches long, which comes from the Seneca river. A frequent short and very wide form has some general resemblance to these, but is in many ways quite distinct. They suggest what is sometimes called the sheaf of wheat pattern, and are often made of the bases of broken arrows, but the form was often the original design. Fig. 195 is a good example, and quite thick. It is of common hornstone, seven eighths of an inch long, and one and one quarter inches wide, but the base does not expand below the broad shoulders, and presents a rounding outline. Fig. 196 is broader, being one and one half inches wide, with the same length. It is of drab flint, more angular than the last, and has distinct barbs and an expanding base. It was always a scraper. This is true of another, even more angular, made of dark flint, three quarters of an inch long, and one and one quarter inches wide. Fig. 197 is another fine scraper of this type. It is of brown flint, one and one eighth inches long, and one and

three quarters wide, with a longer base than in the last. All these, as well as the following two, are from the Seneca river.

Fig. 198 is much like these, but is simply and angularly notched, and has a broad scraper edge. The material is black flint, and it is an inch long, with a little greater width. It is a rare form. Fig. 199 is another small and peculiar form, made of dark flint, and seven eighths of an inch long. It has a scraper edge nearly all around, and the notched stem seems to have been intended for insertion in a handle. The form is unique. Fig. 200 is another odd form from the same river, having rounded projections on the sides, and it is much the thickest at the scraper end, though having a somewhat massive character throughout. It is of quite dark flint, one and one quarter inches long by an inch broad.

Some others combine a short drill with a broad scraper base, but these are usually rather small. The combinations with knives are many. Few implements vary more, and their forms had probably much to do with special uses, as in dressing hides, cleaning fish, or smoothing wooden implements. Their complete disappearance in recent prehistoric times in New York, along with that of other implements quite as remarkable, argues a great and sudden change in the dwellers or visitors here. The Iroquois seem not to have used them, nor do we find any suggestion of a similar implement, as in the substitution of bone or horn perforators for those of stone. The makers of the stone scrapers disappeared from New York long ago, and yet it is clear that they were once very widely used, reaching the Pacific coast and even Mexico. Plainly the modern indian did not inherit some of the most remarkable arts of his predecessors. This is one of the significant revelations of archeology. A new race came in and early arts perished. Beyond the making of arrows and axes scarcely anything survived in New York.

This, however, must be understood of peculiar implements. The dressing of hides still went on, and some of the results have hardly been surpassed. If the Iroquois did not use the stone scraper, or any thing closely resembling it, they employed something quite as effective, and perhaps in a similar way. Corlaer, in 1635, gave *cana-goerat* as the Mohawk word for scraper, which may or may not have

some reference to flint, or *kahnha*. A little later Father Bruyas defined the Mohawk *gannohouagethon*, to scrape a hide, and another word expressed the stretching process. In a rude way they are still, or were recently, in use among some of our western indians, but not in forms like those of old. The Eskimo still use them, inserted in handles, and one specimen here figured is almost exactly like those which they make.

Dr Abbott says of New Jersey scrapers, 'One feature of the European scrapers is having one side flat or uniform, the result of the breaking away of a large flake, thus giving on one side the smooth surface of a single plane of cleavage. We have all our specimens chipped upon both sides, unless it be those of about the minimum size, which appear absolutely identical with the European specimens.' In New York, however, a large proportion of the larger examples have this single cleavage, while full chipping on both sides is confined to a few. From Sir John Lubbock's illustrations, Dr Abbott also thought European specimens rudely chipped in comparison with American, and a similar comparison would show the high character of those of New York.

As regards their distribution no exact statement can be made. In some form they seem distributed throughout the world, but the proportion in any collection will vary according to the field in which it has been principally made. Mr Douglass has 220 New York scrapers, out of a total of 1061. Of these 636 came from Missouri, and 71 from Arkansas. From the New England states he has none at all. Dr Rau figured them only from Ohio and Texas. In the Wagman Saratoga collection none are mentioned, but such omissions may be due to their frequent lack of beauty. In a show collection they might make a poor figure.

SERRATE ARROWS

The serrate arrow forms, which Evans called saws in Great Britain, are quite rare in New York, but are common farther west and south. The materials of which the few found here are made, point to a distant origin. Fig. 201 is of translucent horn colored flint, one and three quarters inches long, and it comes from Nine Mile creek, some miles

west of Onondaga lake. The base is gone, but this example is given because of its distinctly serrate character. Another broken specimen, of bluish flint, now one and one half inches long, is as serrate, and comes from the same vicinity. Good examples should occur in the southwestern part of New York, but none have yet been reported.

FLINT HAMMERS

Flint hammers have thus far been more frequently observed in the lower Mohawk valley than elsewhere. They are rude nodules of flint, showing traces of hammering, and sometimes of chipping, but were naturally used but little in a land where field stones are abundant. They differ much from the so-called hammer-stones. Fig. 202 shows one from Spraker's basin, which is two and one quarter inches across, and just a third as thick, one broad surface being quite flat. Fig. 203 is more characteristic, and is from the Seneca river. This is one and seven eighths inches long, and an inch thick. Fig. 204 is a smaller one, not far from one and one half inches each way. Smaller ones yet appear. A more remarkable one comes from Onondaga lake, which is two and one eighth inches long. Its peculiar feature is the rough grinding in two contiguous planes at one end. Flint is rarely ground here, but when this has been done the result is commonly a polish. A few chipped hammers of greenstone present nothing worthy of remark, except a slight expansion at one end. They are from three to four inches long. The ordinary hammer-stones, and the common field stones perhaps restricted the use of these ruder implements. The faceted and picked balls of stone, possibly used in war clubs, properly belong in another class.

MISCELLANEOUS

There are many odd flint forms of uncertain character. Fig. 205 represents one of these, being a fragment of some article unknown. It may be the base of a knife, but is strongly suggestive of the fine stone sceptres found of late in Illinois and Tennessee. In that case this would have been the upper end instead of the base. It is of thin, light drab flint, neatly worked, and is yet over three inches long. It is broken where a line of fossils crossed the stone.

Unfinished articles often awaken curiosity, and sometimes reveal the processes by which they were made, and the several stages of the work. This is notably the case with some celts, and unfinished drilling has even yet greater importance. With articles of flint it is more a question of ultimate intention. Fig. 206 is an odd article, which may have been a completed and broken implement, or an unfinished one, just as well. What we call the lower part has been broken, giving an element of uncertainty to the actual or intended form. As it now is, it is two and three eighths inches in length, and is made of common hornstone. One side is flat, and the other neatly chipped over most of the surface, the concave edge being thickest. This might be classed among implements combining the knife and scraper, for the convex edge is sharp. There are hints, also, of a future modification of the form. The striking peculiarity, however, is the rounded point, deeply indented below, as if for suspension. Fragments like this and the last, are often valuable for their peculiar features.

Fig. 207 is a small curved scraper of common flint, about one and one half inches long, which is from Cayuga county. It differs from those already described in having simply an expanded base, without a tang. The curve is greater than usual, and it has been accepted by some as the flint point of an early fish-hook, for which it might have answered, though it seems too short and thick for such a use. On the whole it seems more reasonable to place it among the curved scrapers, for grave objections might be made to the other use, and it certainly closely resembles these.

Fig. 208 is simply a flint pebble of an oval form, split in two and chipped on the flat surface. These pebbles are water-worn, and not very large, although this is one of the smaller sizes. They seem unfinished, although neatly chipped; and in their present condition would serve only for scrapers. This one is from Seneca county, and they are found there and elsewhere, although nowhere frequent.

Fig. 209 is one of the smallest forms of New York arrows, of the class called bird points. It is less than half an inch long, and comes from Tioga county, where they are frequent, but with various outlines. Many think these were made for children, on account of their small size, but they are quite as likely to have had other uses.

FISHING AND STONE NET SINKERS

One very important article in the food of the American aborigines was fish. The accounts which early travelers and colonists give of the abundance of all descriptions of fishes in lakes and rivers, seem wonderful now, when we are trying to restore them to some degree of their early condition, and yet they are harmonious and well supported. The only difficulty the indian had was to preserve and store up this abundant supply for hours of need. In Canada and New York, eels were taken in vast numbers, and were easily preserved by smoking. It does not appear that this was usual with fish of other kinds. Salt they did not use, and it was distasteful to them. The Iroquois now ascribe their degeneracy and lack of manly vigor, to using salt meat, instead of obtaining all its fresh juices, as their ancestors did.

It becomes a matter of interest to know how they took the fish which swarmed in every stream, for certain relics have direct reference to this. In doing so, however, bare allusion will be made to harpooning, for the harpoon of colonial times was made of bone or horn, and sometimes of wood and iron, thus lying outside of those chipped stone implements to which this paper relates. Only incidentally will angling be touched upon, for the same reason.

In the account of Champlain's voyages, that great discoverer told of Huron customs. 'The men make the nets to capture fish in summer as well as in winter, when they generally fish, reaching their prey even below the ice, either with the line or the seine.' This winter fishing was described by others as well as Champlain, but he mentions the fact which is of importance here, that the net 'sinks to the bottom of the water by means of certain small stones attached to the end.' While Sagard describes the making of Huron nets and their use, he says nothing of these weights, for the one was a necessity of the other. He does, however, allude to one fact in angling, which is important if we substitute the curved and slender stone drill for the piece of bone. He said, 'We found in the bellies of several large fishes, hooks made of a piece of wood and a bone, so placed as to form a hook, and very neatly bound together with hemp.' A figure has been given of a New York stone perforator, suitable for this use. The

Canadian institute has several well adapted for this also, varying from two and one quarter to four inches in length. The early Huron practice of marrying the nets to two young girls, is well known, and seemed long established when the French first met them. The Algonquins had an old story that Michabou taught their ancestors how to make nets, having taken the hint from watching a spider catch a fly. Nets were therefore plainly an aboriginal invention, and their use is directly connected with the large numbers of flat net stones found by all considerable streams. These nets were made of native hemp, out of which some of the New York Iroquois still make thread in their primitive way.

Mr William L. Stone gave Dr Rau an 'account of a stone structure, evidently a fish-pen, in the state of New York.' It was on the right or south bank of Fish creek, the outlet of Saratoga lake, and the plan and description will be found on page 201, of *Prehistoric fishing*. It is a matter of considerable interest, and Mr Stone readily disposes of a seeming difficulty, the fact that the opening to the pound was down stream, by supposing that it was employed mainly when the fish were ascending the creek to spawn. Such pounds were frequent among the indians elsewhere within historic times, made of stones or wood, and there is no great difficulty in assigning such a use to this. In Sullivan's campaign, in 1779, a town was destroyed on the present site of Waterloo, where were 'several fish ponds abounding opposite the town.' This was the statement of Sergeant Major George Grant. Gen. John S. Clark, a well known antiquarian made a note on this: 'These were circular enclosures of stone from 30 to 40 feet in diameter, built upon the rocky bed of the stream, where the water was neither very deep or rapid, so constructed as to permit the water to pass through, but to retain the fish.' These, of course, were simply places for keeping surplus stock.

These were modern structures. When the famous 'Lessee company' made its agreement with the Six Nations in 1787-88, the indians reserved 'one half of the falls and convenient places for weirs, for the purpose of catching fish and eels, from Cross lake to the Three Rivers.' Without questioning whether eels are fish, it is clear that the Iroquois attached importance to the use of weirs, and that some

might be even now looked for in the waters mentioned. When Francis A. Vanderkemp descended the Oneida river, in 1792, at one rift he remarked, 'It was said here was an ancient indian eel-weir — by which this natural obstruction in the bed of the river had been increased.'

Several such stone weirs still remain in the Seneca river, in a more or less fragmentary condition. One which is several hundred feet in extent, runs in a zigzag way across the river, and two deep bays are in excellent order. The third was removed to permit the passage of large boats. The French missionaries mentioned such structures here in 1656, in these terms: 'The fish which are most common here are the eel and salmon, which are fished for from the spring until the end of autumn, our savages managing so well their dykes and weirs, that they take at the same time the eel which is going down, and the salmon which is going up.' They also speared fish by torchlight, but often used a peculiar wooden spear for this. Fifty years earlier they had bone harpoons.

There are several early accounts of the use of these fish-weirs, in various parts of the country, and Loskiel gives that which was common in Pennsylvania, when the shad ascended the rivers. 'The indians run a dam of stones across the stream, where its depth will admit of it, not in a straight line, but in two parts, verging towards each other in an angle. An opening is left in the middle for the water to run off. At this opening they place a large box, the bottom of which is full of holes. They then make a rope of the twigs of the wild vine, reaching across the stream, upon which boughs of about six feet in length are fastened at the distance of about two fathoms from each other. A party is detached about a mile above the dam with this rope and its appendages, who begin to move gently down the current, some guiding one, some the opposite end, whilst others keep the branches from sinking by supporting the rope in the middle with wooden forks. Thus they proceed, frightening the fishes into the opening left in the middle of the dam.'

Though their use may be inferred in this, nothing is said of stone sinkers. In another account, published by Adair in 1775, there are mentioned on the vine, 'stones attached at proper distances, to rake

the bottom.' This was another use of the flat stone sinker, differing slightly from its use in nets. The polished and grooved plummets, so distinct from these, had other uses, though notably most abundant at two early fishing resorts. The grooved pebbles were many of them sinkers.

It may be remarked that the Hurons and others placed hurdles in streams, with nets across the openings, and that the Oneidas in New York made fish pounds with two rows of stakes across streams, driving the fish into them and killing them there.

The flat stone sinker was easily made by the aborigines, and in fact is still made and used by their white successors. A small flat stone was found and neatly chipped around the edge, or sometimes left almost unchanged. As a sinker it might have two to four opposite notches by which it could be attached more securely. If used as a quoit, the notches might be omitted, and the whole surface neatly chipped. This was the sole difference between these two forms, which might be large or small in either case. Occasionally a small and thin smooth pebble is found on a village site, not over an inch across and with two opposite notches cut in the edge. These have no relation to either of the preceding forms. There are also grooved and chipped stones of considerable size, which were used for anchors, but these are somewhat rare. A series of grooved elliptical pebbles may be classed with those of picked stone, although probably net sinkers. They occur most frequently on Cayuga and Seneca lakes.

Some of the flat sinkers are quite large. Dr Rau figured one which was eight inches across, and one and three eighths inches thick, the weight being two pounds and fourteen ounces. Dr Abbott found one on the Delaware river, which was eight inches square, and had four notches. The weight was nearly five pounds. Here they are rarely much over six inches across, when of the typical form. One fine one, however, unwrought except by the slight notches, is nearly seven inches across, and two and three quarters thick. It may have been used for an anchor, for which it is well fitted in every way.

While abundant near many fishing places on the land, heaps of them have been found in Onondaga lake below the present low water mark, itself the result of drainage. The unnotched forms are

found on village sites, more or less remote from water, and undoubtedly were some form of quoit, or they might also have been used somewhat like the southern chungke stone. They occur in many places where they have attracted little or no attention. Fig. 211 represents an example, made from red sandstone. This has no notches, and was found on a village site in Cayuga county, four miles from any water where nets could have been used. Notched forms, however, occur in earthworks from one and a half to three miles from water. Fig. 212 is a good example of the notched form, three and seven eighths by four and one quarter inches. This is a grey sandstone sinker of medium size, from Cross lake, and is rather thin. The larger sinkers usually have four notches. Grooved sinkers or anchors of the larger and ruder forms scarcely require illustration. One of coarse sandstone comes from Brewerton, and is six inches long by four and one quarter wide, the thickness being three inches. On the flattened surface, lengthwise, a broad and deep groove goes all the way around. Few worked anchors are found.

This is a summary of the leading forms of chipped stone implements found in New York. They preceded and survived the finer articles of polished stone, which is naturally the next subject to be treated, and of which New York furnishes so many good examples. That every important locality will yield striking varieties of chipped implements not here illustrated, is to be expected. The purpose of such a paper is to furnish information, but yet more to be a basis for comparison, so that collectors may judge of the real value of the articles they find, and thus be induced to contribute rare specimens to this department of the state museum.

In conclusion it may be said that the value of many articles depends greatly upon the places where they were found, and that a good record of localities is essential to scientific progress. A good local map, on which sites may be placed; a book of outlines, however rude, with descriptive notes, will aid greatly in doing a noble work for the people of New York. These every collector should have.

EXPLANATION OF PLATES

Fuller descriptions are given in bulletin. For exact page reference see index under *Plates*.

Arrow-heads

FIG.	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES	FIG.	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES
1	Drab hornstone	4	.....	52	Common horn-		
2	Mottled flint	1	1	stone.....	2¼	1½ at base	
3	Brown "	.....	1½	53	Drab flint	1½	.....
4a	Dark "	.....	1½	54	Brown "	1+	.....
4b	Drab "	.....	1½	55	Brown horn-		
4c	a.....	.....	.....	stone.....	1½	.....
5	Dark flint	1¼	.....	56	Dark-blue flint	2	.....
6	Drab "	2½	.....	57	Common "	2	.....
7	Drab "	2	.....	58	Light brown "	1¼	¾ at base
8	Common "	1½	.....	59	Drab "	2½	1½
9	Mottled "	2	.....	60	Light color'd "	1—	.....
10	Grey "	1¼	.....	61	Dark "	1	.....
11	Grey "	.....	.....	62	Light bluish "	1½	.....
12	White "	.....	.....	63	White "	1½	.....
13	Lustrous "	2½	.....	64	Dark blue "	1	.....
14	Bluish-grey "	2½	.....	65	Drab "	¾	.....
15	Common "	1¼	.....	66	Drab "	1	.....
16	Dark "	2½	.....	67	Drab "	2	.....
17	Common "	2	.....	68	Common "	1½	.....
18	Common "	1¼	.....	69	Drab "	1¼	.....
19	Stone	1½	.....	70	Drab "	2½	.....
20	Grey flint	1¼	.....	71	Black "	2	.....
21	Common "	1½	.....	72	Common "	1¼	.....
22	Common "	2½	.....	73	Dark "	1½	.....
23	Brown flinty			74	Dark "	2½	.....
	sandstone...	1¼	.....	75	Dark hornstone	2½	.....
24	Dark blue flint	1¼	.....	76	Dark flint	2	.....
25	Lustrous jasper	1½	.....	77	Light "	1¼	1½
26	Grey flint.....	1½	.....	78	Brown "	2½	.....
27	Yellow jasper..	1	.....	79	Drab "	¾	.....
28	Flint.....	1¼	.....	80	Black "	1½	.....
29	a.....	.....	.....	81	Dark "	1¼	.....
30	Yellow jasper..	¾	.....	82	a.....	1½	.....
31	White flint	2½	.....	83	White quartz..	2	.....
32	Common "	1½	.....	84	Drab flint	2¼	.....
33	Brown "	1¼	.....	85	Blue "	2½	.....
34	White "	1½	.....	86	Common horn-		
35	Drab "	1½	.....	stone	1¼	.....
36	Drab "	1½	.....	87	Olive slate.....	.....	.....
37	Grey limestone	2	2—	88	Drab flint	2¼	.....
38	Common flint..	1½	.....	89	Brown "	1	.....
39	Yellow jasper..	1	.....	90	Drab "	1½	.....
40	Black flint....	1½	.....	91	Dark "	1¼	.....
41	Shark's tooth..	1½	.....	92	Dark "	1½	.....
42	Grey flint	2½	.....	93	Dark "	1½	.....
43	Common "	2½	.....	94	Common "	1+	¾
44	Blue .....	.....	1½ at base	95	Grey flinty		
45	Common horn-			limestone ...	2¾	.....
	stone.....	.....	1¼ at base	96	Red jasper....	1½+	.....
46	Drab flint	1½	.....	97	Blue flinty		
47	Drab "	1¼	.....	limestone....	1½	.....
48	Brown "	1¼	.....	98	a.....	2½	.....
49	Brown "	1½	1½	Purplish flint..	2	.....
50	Brownish-white			100	Common horn-		
	flint	1½	.....	stone.....	1	.....
51	Brown flint...	1½	.....	101	Dark blue flint	2	1¼

a Not given

EXPLANATION OF PLATES, *continued*

Spear-heads

FIG.	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES	FIG.	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES
102	White flint	6½	.....	114	Resembles moss agate..	3½	.....
103	Grey "	5½	.....	115	Flint.....	4¼	1—
104	Black "	5½	.....	116	Grey flint....	4¼	.....
105	Common "	7	.....	117	" quartzite (?)	5½	.....
106	Translucent quartz.....	4¾	2	118	Variegated hornstone...	2½	.....
107	White mottled quartz.....	3¾	1½	119	Resembles moss agate..	5+	.....
108	Green jasper..	9 from base ^b	4 at base	120	Greenish white flint.....	4¾	.....
109	Drab flint	3¾	1¾	121	Common horn- stone.....	2¾	.....
110	White translu- cent quartz...	.....	.....	122	Hornstone...	3¾	.....
111	Drab flint	3½	1¾	123	Blue grey flint	7¼	.....
112	Common "	6	2	124	Chalcedony...	4¾	2
113	Grey flinty limestone...	6+	1¾	125	Drab flint....	2¾	1½

Knives

126	Grey flint....	3¾	.....	137	Brown flint	3¾	.....
127	Yellow jasper	3¾	2	138	Brown "	2½	.....
128	Drab flint	4	.....	139	Brown "	3	.....
129	Light blue "	5	.....	140	Variegated "	2	.....
130	White "	3	.....	141	Common "	2¾	.....
131	Common "	1¾	.....	142	a.....	4¾	1½
132	Dark blue "	1¾	.....	143	Grey limestone	3¾	1½
133	Grey limestone	2	.....	144	Hornstone...	5	2¾
134	Clouded quartz	6½	2	145	Common flint..	3½	.....
135	Brown flint	3¾ ^b	.....	146	Bent arrow form.....	.....	.....
136	Brown "	3¾	.....			

Spades or hoes

147	Bluish grey stone.....	11¼	5¾	149	Grey flint....	4	.....
148	Common flint	3¾	.....	150	Orange jasper	5	3¾
				151	Red sandstone	5¾	3¾

Chipped stone axes

152	Brown sand- stone.....	5¾	.....	156	Drab flint....	2¾	.....
153	Ferruginous flint.....	5¾	3¾	157	c.....	.....	.....
154	Common horn- stone.....	2¾	¾	158	c.....	.....	.....
155	Grey flint....	2	1	159	Brown flint...	4	.....
				160	Common horn- stone.....	2¾	1½
				161	Clouded quartz	2¾	2

Perforators

157	Common flint	3	3+	169	Drab flint	1½	.....
158	Bluish "	1—	.....	170	Black "	2½	.....
162	Brown "	3¾	.....	171	Grey "	2½	.....
163	Yellow shaded to red.....	3¾	.....	172	a.....	.....	.....
164	Mottled flint	2½	.....	173	Drab flint	1½	.....
165	Grey "	3¾	.....	174	Drab "	1¾	.....
166	Light brown "	1¾	.....	175	Dark "	1¾	.....
167	Common "	1¾	.....	176	Common horn- stone.....	2¾	.....
168	Brown "	2	2—				

^a Not given^b Fragment. Length unknown^c See under *Perforators*

EXPLANATION OF PLATES, *concluded*

Scrapers

FIG.	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES	FIG.	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES
177	Broken arrow head.....			189	Common flint	1½	.....
178	Brown flint	2¾	.....	190	Brown "	3	.....
179	Brown "	2¾	.....	191	Brown "	1¾	.....
180	Dark "	1	1	192	Green jasper..	1¾	.....
181	Hornstone....		1	193	Grey flinty limestone ..	2	.....
182	Hornstone....		1—	194	Brown flint	1¾	.....
183	Common flint	¾	.....	195	Hornstone....	¾	1¼
184	Drab "	1¾	.....	196	Drab flint	1½	1½
185	Brown "	1¾	.....	197	Brown "	1¾	1¼
186	Brown "	5½	.....	198	Black "	1	1+
187	Brownish grey flint.....	4¼	1	199	Dark "	¾	.....
188	Dark blue flint	2	.....	200	Dark "	1¼	1

Serrate arrow

201 | Translucent fl't | 1¾ | |

Flint hammers

202 | | 2¼ | 204 | | 1½ | 1½

203 | | 1¾ | |

Miscellaneous

205 | Drab flint.... | 3 | | 208 | Flint pebble.. | |

206 | Hornstone.... | 2¾ | | 209 | Bird point | |

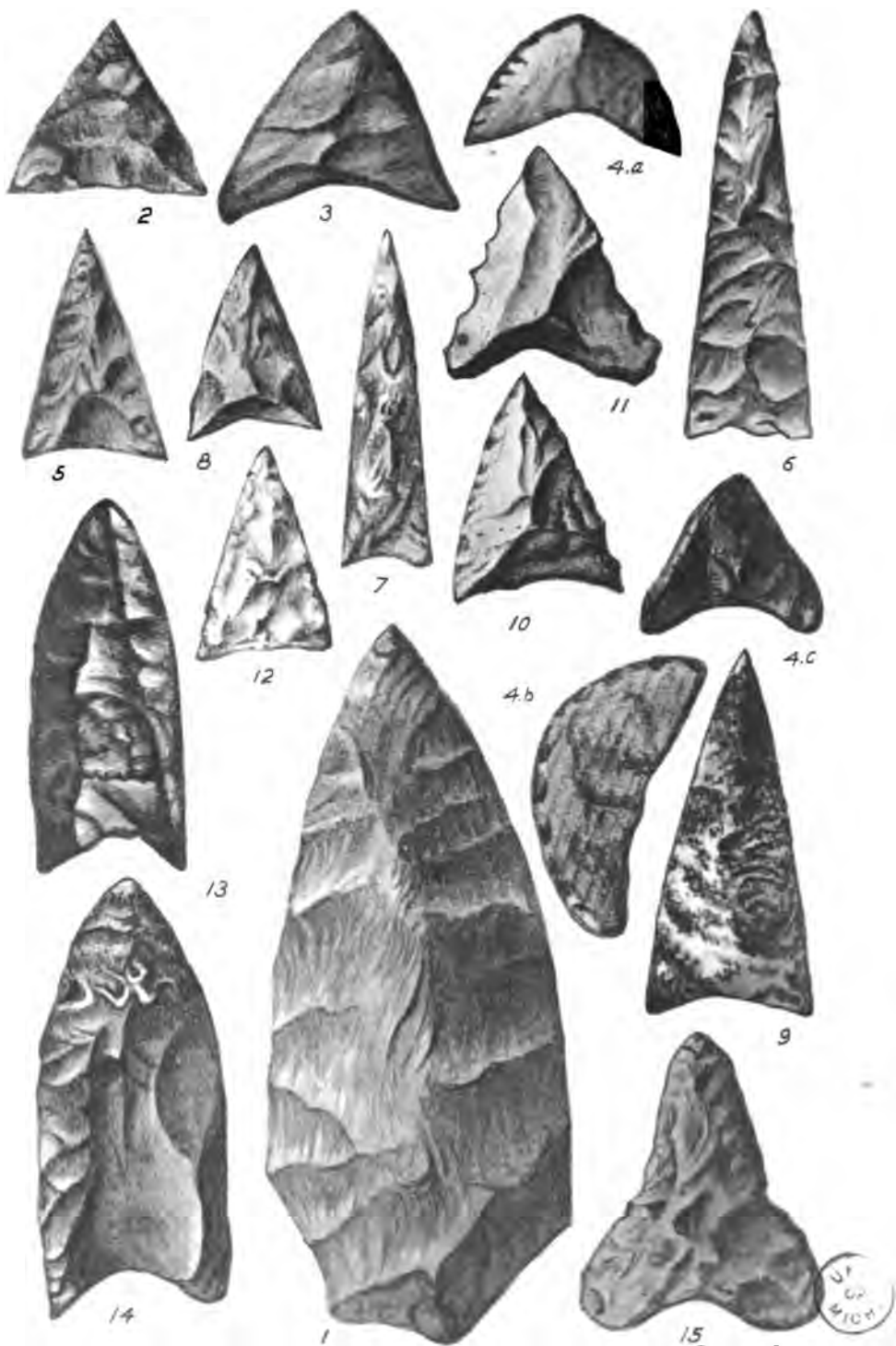
207 | Common flint | 1½ | | | arrow..... | ½— | |

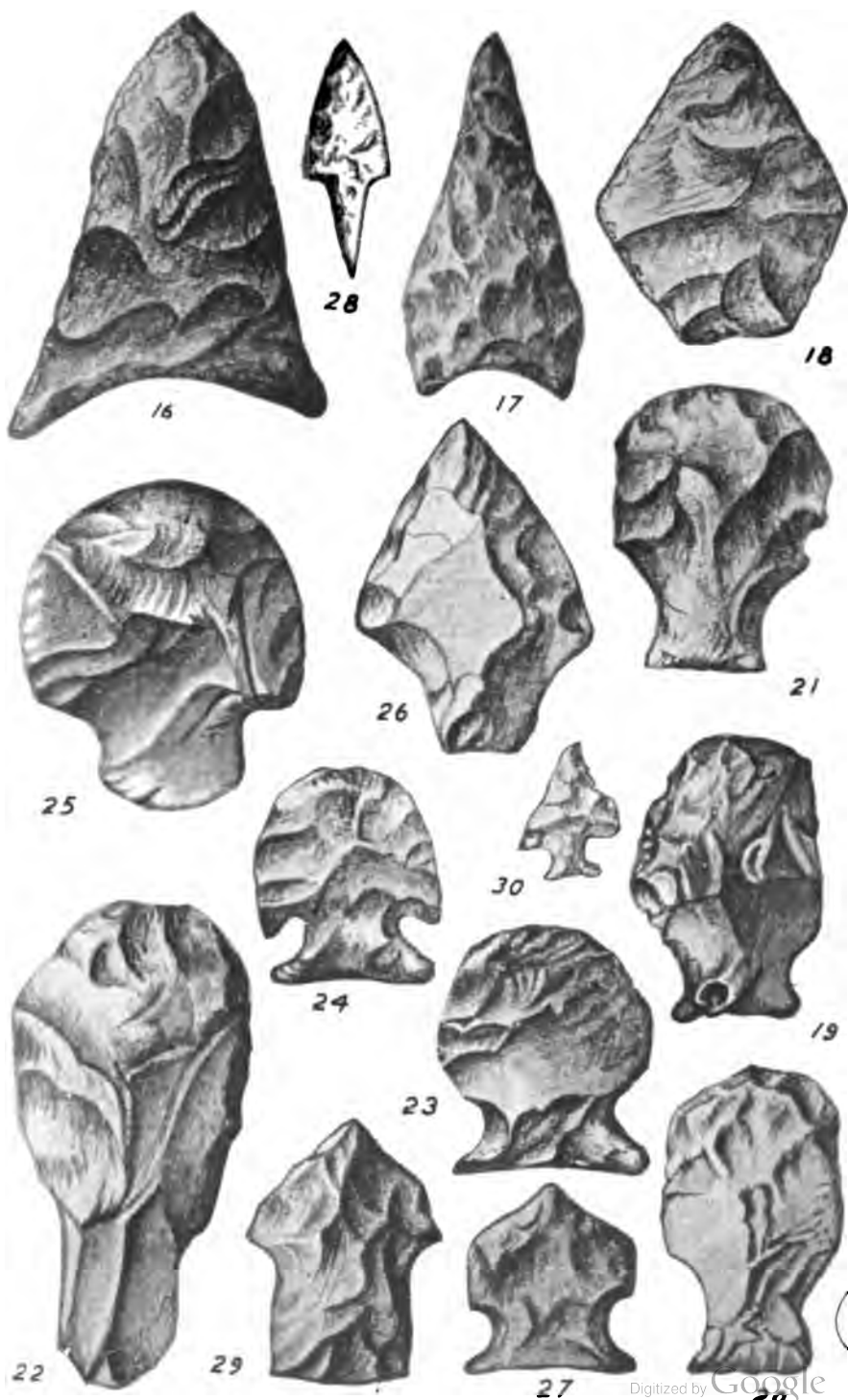
Stone sinkers

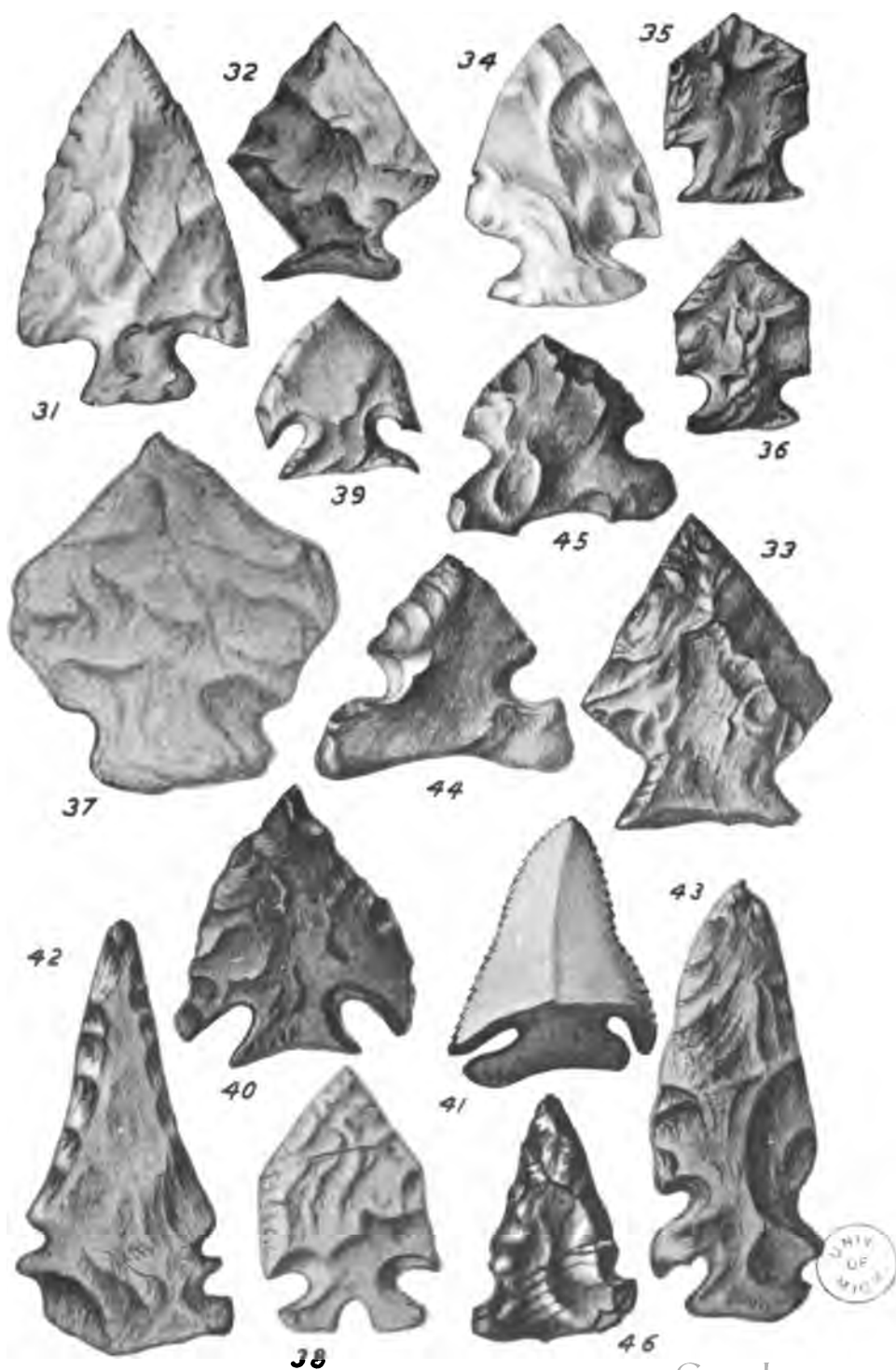
210 | a | | 212 | Greysandstone | 3¾ | 4¼

211 | Red sandstone | |

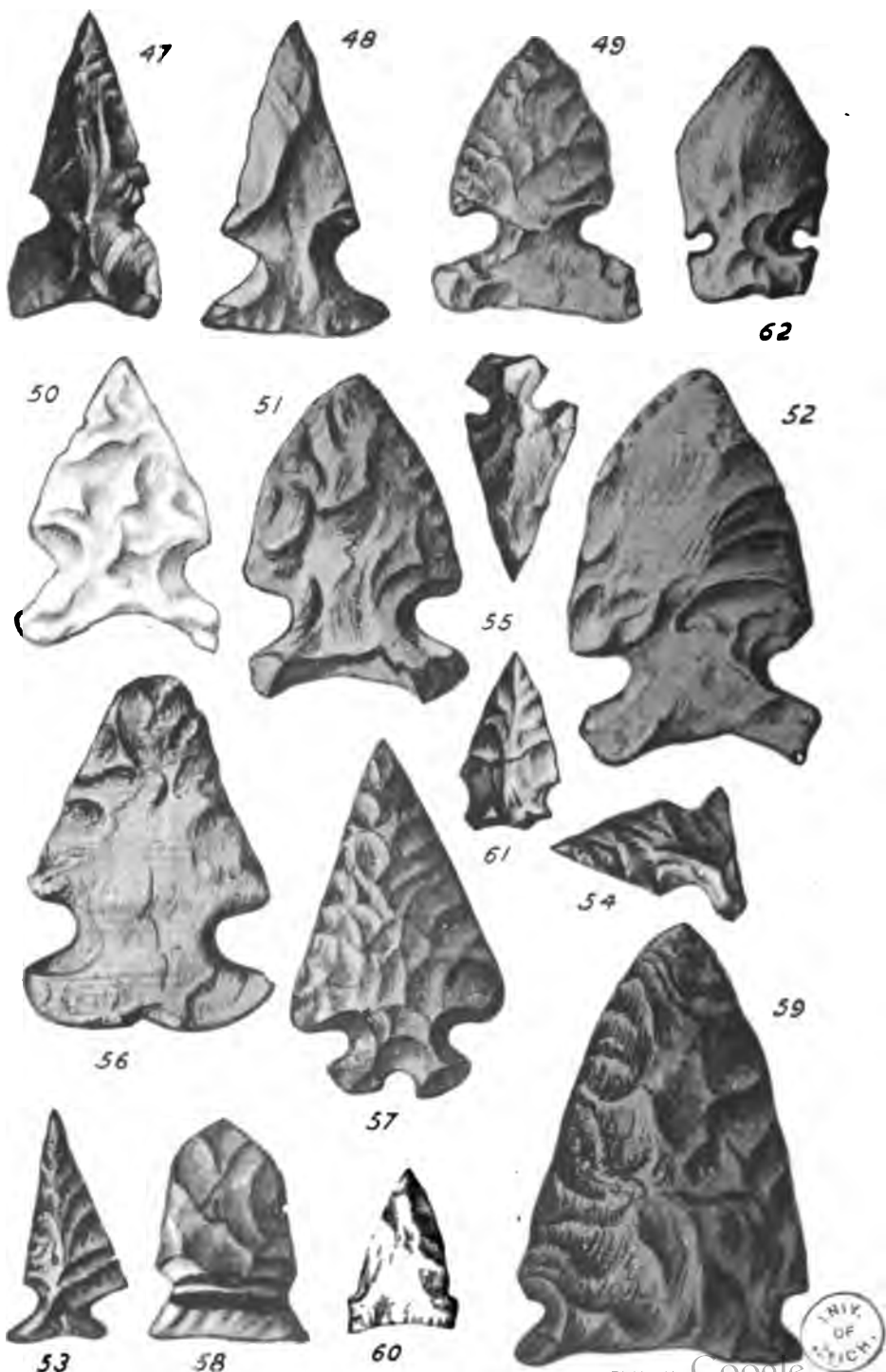
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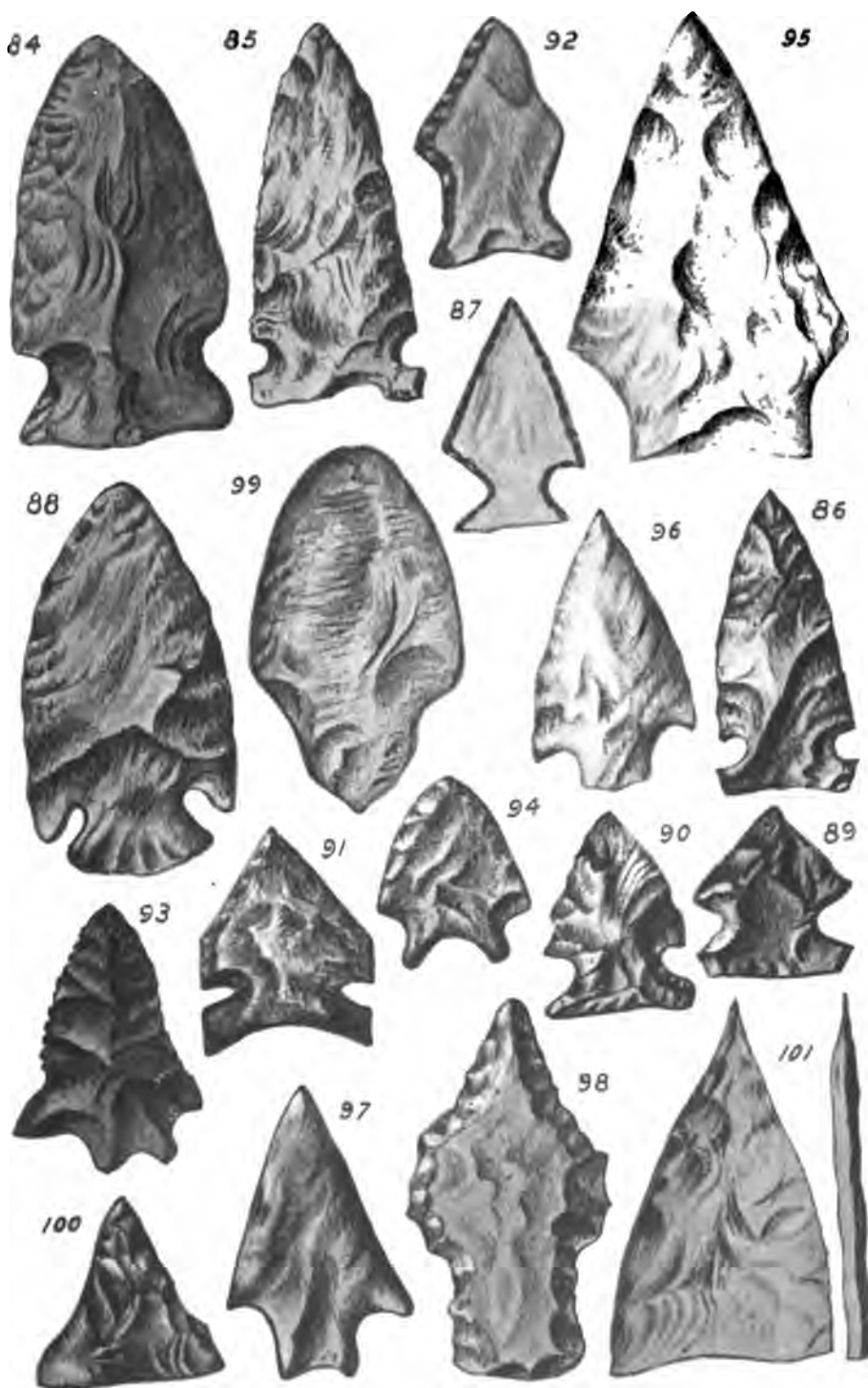


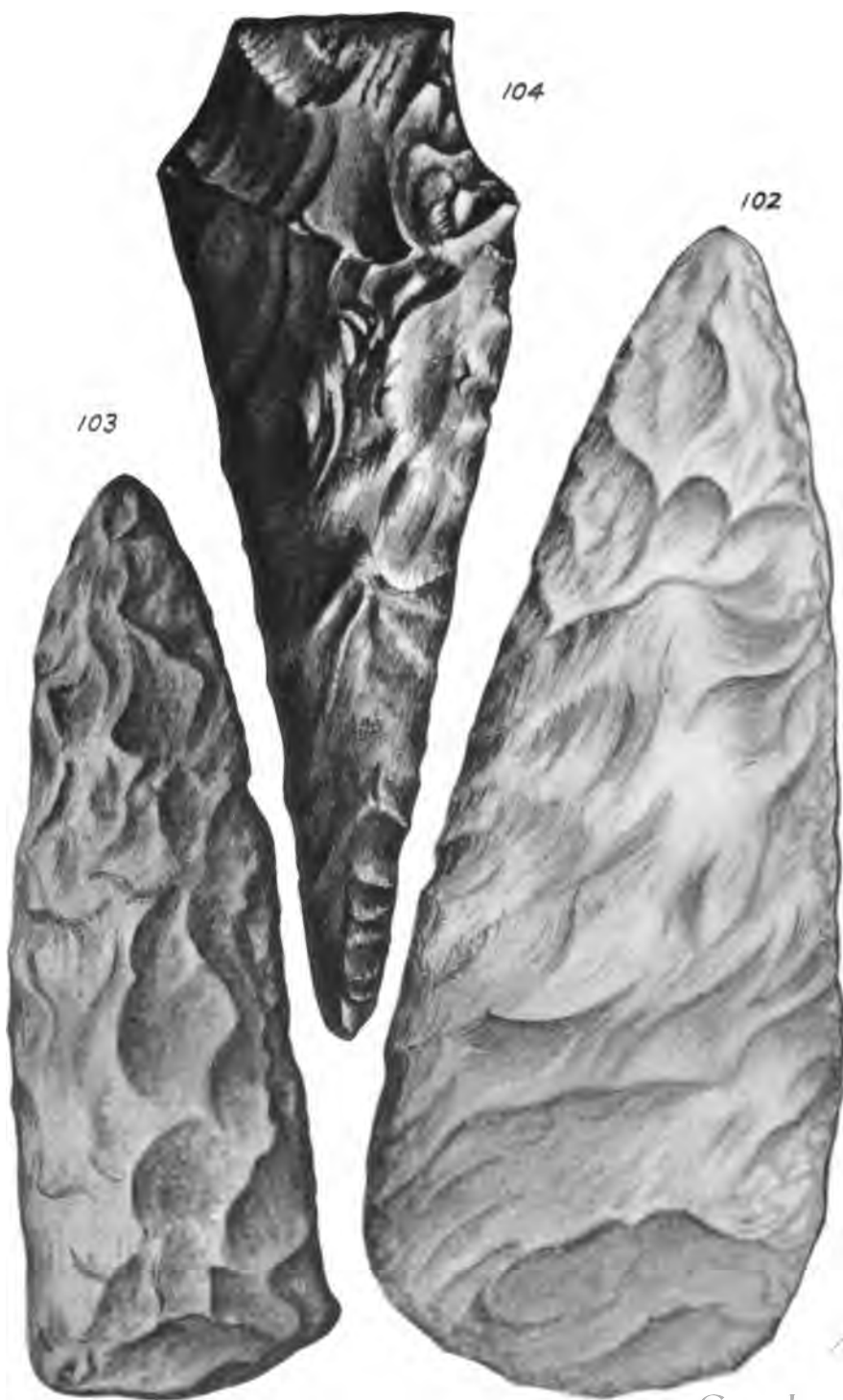












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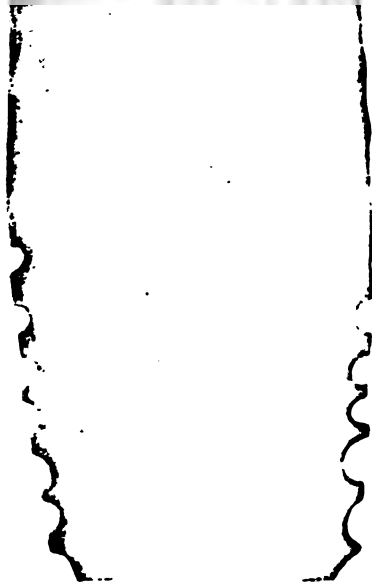
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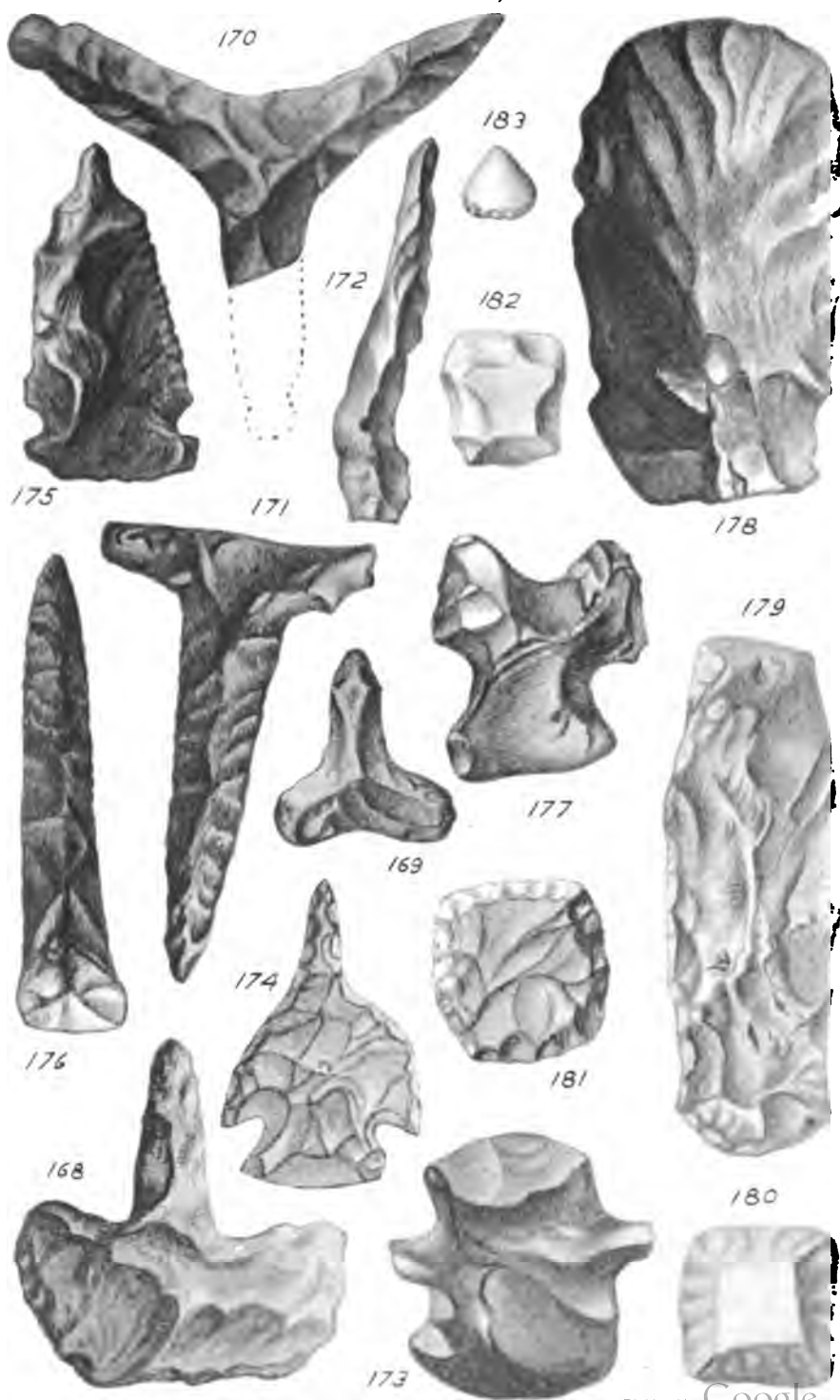


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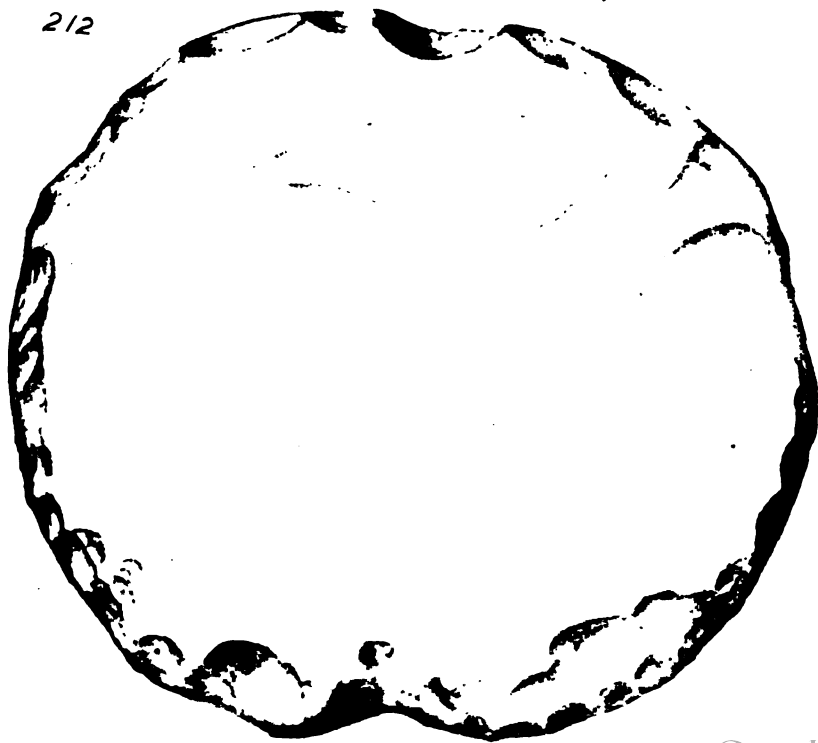






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University of the State of New York

BULLETIN

OF THE

New York State Museum

VOL. 4 No. 17

OCTOBER 1897

ROAD MATERIALS

AND

ROAD BUILDING

IN

NEW YORK

BY

FREDERICK J. H. MERRILL, PH. D.

Director New York State Museum

ALBANY

UNIVERSITY OF THE STATE OF NEW YORK

1897.

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PREFACE

This bulletin was prepared at the request of the chairman of the state museum committee for a report on the road materials of New York. Having ascertained what might be worth publishing on this subject, it appeared desirable to add a short discussion on the road problem in our state.

It has been the writer's aim to make the pamphlet as brief as possible and therefore easily read. He has endeavored to discuss concisely what appeared to him the salient points of the problem, and his purpose has been rather to bring to public attention, facts not generally appreciated than to discuss matters of common knowledge.

In preparing this report the writer has communicated with about two thousand quarrymen, and has acquired much information concerning local variations in rock used as road metal, but it does not seem pertinent to this preliminary publication to discuss details which might obscure the main points. It seems also inadvisable to publish statements which discriminate between the products of various quarries until further study has established their correctness beyond all possibility of criticism. These details are therefore reserved for future publication.

The report of the special committee on good roads, transmitted to the legislature Jan. 14, 1896, is recommended to the attention of all who wish to inform themselves on the details of the present situation in New York, Massachusetts, Connecticut and other states.

Attention is also called to the publications of the Bureau of Road Inquiry of the U. S. Dept. of Agriculture.

It being impossible with the museum funds at hand to erect a laboratory for the testing of New York road materials, the writer applied for assistance to the Massachusetts Highway Commission, which courteously and generously agreed to test some representative samples of New York road material.

In the following pages the Massachusetts Commission has been quoted exclusively, not from a desire to ignore the work in other states, such as New Jersey and Connecticut, but because the problems in Massachusetts are similar to those in New York, and the Commission in question seemed to have studied and reported on the situation it had to deal with in a more detailed and exhaustive way.

To Prof. N. S. Shaler and the other Highway Commissioners of Massachusetts, the writer desires to express his deep obligations for many favors received.

FREDERICK J. H. MERRILL

Albany, Sept. 1, 1897

INTRODUCTION

GOOD ROADS IN NEW YORK

The present condition of the highways of New York is about the same as that of the roads of England at the beginning of this century, when they were so bad and the toll rates were so high that the subject of their improvement forced itself upon the attention of the British public. From the investigations which ensued under the supervision of prominent engineers, certain rules for road building were formulated, the adoption of which led to the construction of the fine highways for which Great Britain has so long been famous.

At that time there were no railroads in England and all produce was transported by wagon or canal so that the subject of road improvement was one of great commercial importance. The necessities of the occasion brought to the front in Great Britain many road engineers, most prominent among whom were Macadam and Telford, advocates of two different systems of road building, which are now used variably, according to the nature of the ground where the road is to be built. Road building under state supervision has long been a feature of European government and the time has now come when it must be recognized as a necessary function of government in the United States.

The important reasons for road improvement throughout our country are three: 1st the desirability of reducing the cost of hauling; 2nd the importance of making most of our roads fit for pleasure driving, thereby attracting to the rural districts in summer, thousands of people who create a local market for various farm products; 3rd the economic principle of preventing the great waste of labor which is now fruitlessly expended in making bad roads.

The state of Massachusetts, which in our own country leads in systematic road building, has a highly organized highway commission, which has been at work since 1894. Under the direction of this commission the important highways of the state have been measured on the new topographic map and their total length determined to be 20,500 miles, exclusive of minor cross roads. The commission has projected the construction of a network of state roads amounting to 10 % of the whole, connecting the more important points throughout the state. At

different points on this projected network the commission has constructed, by request of local authorities, short pieces of road a mile or more in length, according to the most approved methods of road building, to serve as object lessons and create by the experience of their high quality a public demand for farther construction. These short pieces are extended from year to year to carry out the general plan.

Through the courtesy of the commission I am enabled to make a statement of the appropriations and expenditures from 1894 to the present time. I quote the following from a letter written to me by Mr. A. B. Fletcher, secretary :

"In 1894 and 1895, 86.37 miles of road were laid out. These roads cost on an average, for actual construction expenses, about \$9,612. per mile, and the engineering and inspection charged to them was \$1,130. per mile, making a total of \$10,742. the average cost of the roads per mile, exclusive of office expenses and salaries of the commission and clerks.

"In 1896 39.8 miles of road were laid out. These roads not being complete in all cases, the cost shown is to some extent an estimate. It is estimated that these roads will average about \$7,900 per mile for the actual construction, and \$741 for the engineering and inspection, a total of \$8,641 per mile."

The appropriations for the use of the commission have been as follows :

1894.....	\$300,000
1895.....	400,000
1896.....	600,000
1897.....	800,000
Total.....	<hr/> \$2,100,000

From this it will be seen that with three years of careful work, Massachusetts has built 126 miles of good road in different parts of the state to serve as object lessons to the people.

As this official statement shows, in 1896, with an appropriation of \$600,000, Massachusetts constructed forty miles of high class road. Since the appropriation for 1897 is \$800,000, it may be assumed that a much larger mileage will be completed. As a certain proportion of the money appropriated is used for official and clerical salaries and expenses, the whole of the appropriation is not available for road building alone, but assuming the number of miles to be constructed in 1897 at 80, it appears that the total mileage to be rebuilt (2,000) would be completed at this rate in 25 years. It will be seen that the plan of road improvement now adopted in Massachusetts, is not intended to provide for any general improvement in the 18,500 miles of public highway not included in the system to be rebuilt by the state, except through the influence of the object lessons furnished in the local examples of new state roads.

THE PROBLEM OF ROAD IMPROVEMENT IN NEW YORK

It being generally conceded that better roads are a necessity in New York and there being no economical way of obtaining good roads except by building the best, the question arises as to the source of the money necessary to do this work.

High class roads, if not built by the state, can at present be afforded only in regions inhabited by persons of more wealth than the average farmer. Near the large cities are great areas tenanted by those who have business in the city, but prefer to live in the country. There the property values are much higher than in regions exclusively devoted to agricultural interests and the taxes being proportionately higher, it is possible to spend more money in road building. Under the present system of road tax prevalent over the greater part of the state, the equivalent of about \$75 a mile per annum is supposed to be raised in each road district outside of the village corporation limits, and it frequently happens that the whole of the tax is not worked out. Moreover, in many districts the people work their road taxes without intelligent supervision and often not only is the labor wasted but the roads are made worse.

The state of New York having an area six times as great as that of Massachusetts, has probably six times as many miles of important roads; there being as yet no complete map of our state, it is impossible to make accurate measurement. The total mileage of important roads in New York may therefore be estimated at 123,000. This figure, while only an approximate maximum, is sufficiently accurate for purposes of estimate.

If it were decided to improve 10% of this total according to the Massachusetts plan, there would be 12,300 miles of road to build. While Massachusetts now appropriates \$800,000 a year for road building, New York, if doing this work at the same rate in proportion to her size, would appropriate \$4,800,000 a year. This sum would be more than one third of the total amount raised in New York by direct taxation, which is now in round numbers \$12,033,651.80. This is undoubtedly too large a burden to be carried, but we could safely afford to spend from \$600,000 to \$1,000,000 per year in this work, which can not be avoided and must sooner or later be undertaken.

In senate bill no. 330 of 1897 introduced by Hon. Richard Higbie, it was proposed to levy 'in the general appropriation act of each year, a tax rated at one tenth of a mill upon the entire valuation of the state, which shall be known as the state highway tax.'

The total value of taxable property for the current year is stated by the comptroller to be \$4,506,985,694. This sum when taxed at the rate of one tenth of a mill would yield an annual amount of \$450,698.56 available for the construction of state highways. On this basis each taxpayer would contribute only 10 cents on each \$1,000 of assessed valuation.

It is considered by many that the wiser method would be to divide the cost between the *state*, the *county* and the *locality benefited*.

The proportionate division suggested in senate bill no. 330 of 1897, is one half by the state and one half by the county; it being also provided that the amount paid by each county may be apportioned by the board of supervisors so that 35% of the cost shall be a general county charge and 15% a charge upon the town in which the improved highway is located, or to be assessed upon and paid by the owners of the lands benefited, according as the request for the improvement comes from the board of supervisors of the county or from the owners of one third the lineal feet frontage.

As it is to be expected that the cost of road building in New York would be about the same as in Massachusetts, viz, \$10,000 per mile, the cost of rebuilding at state expense the great system of public highways mentioned above would be about \$123,000,000.

If so large a sum as \$4,800,000 a year were appropriated and it were found possible with this sum to build 480 miles of road per year, a period of 25.6 years must elapse before the completion of the work. On the other hand, if New York were to appropriate exactly the same amount as Massachusetts, viz, \$800,000 per year and could build 80 miles per year, it would require 153.75 years to complete the system of 12,300 miles. During all of this time and for all time to come *there would remain in New York a vast network of 110,700 miles of road inadequately cared for, as at present, unless some plan for intelligent supervision and repair were provided in addition to that for the work of constructing state highways.*

The apparent difficulty of enacting legislation involving a work of such great expense and covering so long a period of time leads to the belief that the solution of the road problem in New York is to be found in the division of the expense of state road construction between the state, the county and the locality benefited as already mentioned. Even this would not be a rapid process; allowing \$1,000,000 for the construction of 100 miles of road per year, 123 years would be required for the completion of the undertaking.

The foregoing statements of expense and time are not made as arguments against state roads, but to call attention to the magnitude of the project and the fact that the work must be carefully planned. It does not seem necessary that the facts should be concealed from the public in order that the work may be undertaken. It should not be assumed that the work can be started only by concealing the total cost.

The legislation hitherto proposed has chiefly aimed at a few state roads. This is insufficient. We need a trained supervision over all public roads.

In order to meet these requirements it is most important that a bureau or commission of road improvement be created by the state with, at first, a small appropriation for the practical study of the road problem in New York, and the development of plans for the building of state highways and the working of all other roads under trained supervision. If our next legislature, as all good citizens must hope, shall decide to create a commission or bureau of state highways or a superintendent of highways *the measures then enacted should provide not only for the formation of a plan to build certain state roads which shall be models of engineering work but for the intelligent supervision of the general repair work done on the other roads of the state during the centuries which must elapse before our main roads are put in proper condition.*

A bill was introduced into the legislature of 1897 to compel the payment of all road taxes in money. While this is a most important measure which should be made a law, it is insufficient as it provides no supervision over the manner in which the money is to be spent. According to the observation of the writer, there are large areas in New York where the people do not know how to spend their road taxes to advantage, and where the tax if actually paid in money would still be wasted, unless some trained supervision were provided by statute.

Not every civil engineer is competent to superintend road work, not every farmer is ignorant of road making; but it frequently happens that commissioners of highways have not the necessary experience and training to fit them for their office; and, serving without salary, they can not afford to give the necessary time to the road districts under their supervision. It seems indispensable that apart from and in addition to any system for the building of state highways, there should always be a corps of trained inspectors, men of experience and capacity in road building, selected solely for their qualifications and under the direction of a central bureau or commission, who would in each county, town and road district supervise the work on roads not yet being rebuilt under state super-

vision, in order that the road taxes may be economically and efficiently spent. Such inspectors must necessarily receive salaries commensurate with their qualifications. These salaries should be paid in part by the state to insure central control and the adoption of uniform standards and in part by the counties where the inspectors are stationed in order to lessen the general burden of taxation.

The League of American Wheelmen is doing much in New York to arouse public opinion in favor of good roads. It is to be hoped, however, that this influential organization will not confine its attention to state roads alone but will advocate some measure to improve the general system of road supervision and repair.

It has been suggested that a part of the excise revenue under the Raines law might be used for building roads. This practical question must be decided by the people and their representatives in the legislature.

NATURAL ROADS

In the United States most roads have natural beds and the character of these beds is determined by the geology of the region in which they lie.

Hence the road beds consist of clay, sand, loam or gravel, or occasionally are on the surface of the country rock which may be shale, sandstone, limestone, etc.

From the fact that an unfertile soil is not good for road building, it usually happens that the poorest roads are in regions of poor farms where property values and consequently taxes are low and there is little money to spend on the roads. This is especially true in stony districts, for a stony soil is a most unmanageable material for a natural road.

Of the natural roads those on clay soil are best in dry weather, those on sand best in wet weather. When wet with a certain proportion of water, fine sand becomes hard and elastic as we see on the beaches of our Atlantic coast, where good natural roads are found near the water's edge.

Of the natural soils the best for road purposes are those variable mixtures of sand and clay called loams. Loam roads average better through the year than those of clay or sand. A limestone gravel makes a very good road, and also a fine quartz gravel mixed with clay.

From every-day experience, it is clear that natural road beds are not the best for heavy traffic when under varying conditions of moisture. It

is also clear that for many centuries to come, large areas of our country can hope for nothing better than good natural roads.

The faults of our natural roads which could easily be remedied are mainly these :

1 The roads are too narrow and too high in the center, and on account of their narrowness the wheels all run in the same track and the extreme curvature of the road bed compels the wheels to run on the edge instead of the surface of the tires, the combination of the two faults causing the formation of deep ruts ;

2 Loose stones are allowed to remain in the roads and the work of repair is not directed toward keeping the surface smooth ;

3 Insufficient attention is given to the construction of drains and culverts.

ROAD CONSTRUCTION

The experience of over 2,000 years has shown conclusively that there are two essential points to be aimed at in the construction of a perfect road ;

1 A hard, smooth, waterproof surface ;

2 A thoroughly dry foundation.

These principles were known to the Romans three hundred years before Christ and used in the construction of their best highways.

The surface of a good road must be of sufficient strength to resist the wear and tear of traffic, and smooth enough to prevent undue strain and wear on vehicles. In connection with this *the soil beneath must be made dry and kept dry*. Therefore the subject of road drainage is as important as that of road metalling.

The best road covering is composed of angular fragments of some stone which will grind on the surface into a dust, which when wet will bind or in a measure cement the fragments together, so that water will not penetrate. The angular form is essential to make the fragments interlock. The sizes should be quite uniform, except that the surface layer may consist of fragments different in size from those in the bottom course.

The total thickness of this metalling must be at least six inches on a natural soil foundation. The fragments should not exceed two and a half inches in diameter, and should be rolled in two separate courses with a heavy steam roller until the surface is absolutely firm. This is the Macadam system.

Where the soil foundation is clay, or for any reason difficult to drain, the Telford method is used. In this case a course of flat stones about six inches deep, set on edge and closely wedged together, is placed upon the soil and crushed stone is placed over this four inches thick and rolled solid. In good practice it is customary to roll the earth before the stone is laid upon it and then roll the stone foundation. The Telford foundation forms a bridge which prevents the road from sinking in moist soil and is rendered completely effective by tile drains on each side of the road. *After the road is built it must be kept constantly in repair and the neglect of this principle is to a great extent responsible for the poor roads of the United States.*

The Macadam and Telford systems above described are necessary for roads designed for heavy traffic in all weathers, but roads for pleasure driving in summer only, do not need the same expensive preparation.

As an example of the methods adopted for the construction of high class roads I am permitted by the courtesy of the Massachusetts Highway Commission to quote the following extracts from its pamphlet of *Instructions to engineers*, published in 1896:

Gravel. You will use gravel for surfacing the road bed under telford; also for surfacing the sub-grade where the natural soil is clayey, loamy, or where ordered under other conditions by the chief engineer. The gravel must be practically free from sand and clay.

Broken stone. State highways are divided as follows with reference to the broken stone (sizes given are in inches):

- 1 All trap rock, 1 bottom 1st course to be $1\frac{1}{4}$ to $2\frac{1}{2}$; top course to be $\frac{3}{2}$ to $1\frac{1}{4}$;
- 2 All trap rock, both courses to be $1\frac{1}{4}$ to $2\frac{1}{2}$;
- 3 Local stone other than trap, bottom course to be $1\frac{1}{4}$ to $2\frac{1}{2}$; top course to be $\frac{3}{2}$ to $1\frac{1}{4}$;
- 4 Local stone other than trap, both courses to be $\frac{3}{2}$ to $2\frac{1}{2}$;
- 5 Bottom course of local stone other than trap, $\frac{3}{2}$ to $2\frac{1}{2}$; top course of trap rock, $\frac{3}{2}$ to $1\frac{1}{4}$;
- 6 Bottom course of local stone other than trap, $\frac{3}{2}$ to $2\frac{1}{2}$; top course of trap rock, $1\frac{1}{4}$ to $2\frac{1}{2}$;
- 7 All trap rock, bottom course to be $\frac{3}{2}$ to $1\frac{1}{4}$; top course to be $1\frac{1}{4}$ to $2\frac{1}{2}$;
- 8 Local stone other than trap, bottom course to be $\frac{3}{2}$ to $2\frac{1}{2}$; top course to be $1\frac{1}{4}$ to $2\frac{1}{2}$.

When 'local stone other than trap' is used you must not allow any soft or disintegrated rock to go upon the road; all such rock must be rejected before breaking. If the contractor fails to remove such rock, immediately report the fact in writing to the chief engineer.

All broken stone must be screened, and any broken stone which will not pass through a $2\frac{1}{2}$ inch ring, or is more than $2\frac{1}{2}$ inches in its largest diameter, must be rebroken or rejected.

In every case the screenings used on the surface as a binder course must be of the same kind of stone as the top course of the road.

Rolling. When possible roll the sub-grade with a steam roller.

If the sub-grade is too sandy to roll, cover with coarse gravel laid on to a depth of 3 inches, or as much more as may be needed to give a good foundation.

Fill any depressions with the same material until the surface is true and even.

All broken stone must be rolled in screened layers.

After spreading the first course of broken stone, begin rolling at the sides, and continue this by running ahead so as to allow from 2 to 5 inches of the driving wheel to pass over the shoulder, and backward with the outer edge of the driving wheel from 5 to 10 inches inside the edge of the broken stone. Roll until the stone ceases to 'wave' in front of the wheels, and until it seems firm under foot as you walk over it. Next begin on the other side and roll in the same manner. Then work toward the center until the stone is rolled. Roll each layer of stone in the same manner.

If the road shows a wavy motion after passing the roller over it three, four or more times, it may indicate too much moisture in the sub-grade. If, on examination, you find this to be true, stop rolling and move ahead, allowing time for the sub-grade to dry out.

With some coarse, hard granitic rocks it has been noted that after the roller passes over them a few times they begin to 'crawl' and the sharp edges break off. A slight sprinkling of sand or stone screenings, or water, may prevent this. Try one after another of these means, until the work progresses to your satisfaction. You must not expect to prevent the stone from shaking as you walk over it, but you need to continue the rolling until the fragments of stone adjacent to where the foot presses do not move as you walk. Most of the rolling must be done before you spread the screenings. After spreading the screenings, water and roll until the mud flushes to the surface. You can not expect to prevent the stone from kicking out if the teams pass over the road. Keep watch, and in a few days have the roller pass once or twice over the road, after watering, until the loose stones are pressed down out of sight.

Before spreading any broken stone, great care must be taken to have the sub-grade carefully shaped and thoroughly compacted.

All shoulders must be shaped and left sufficiently high to roll to the proper grade, before any broken stone is spread on the road.

In case of heavy fills you must not run the roller to the edge of the shoulders unless the fill has had time to settle. Work out slowly on this kind of work.

In every case the screenings used on the surface as a binder course must be of the same material as the top course of the road.

Excepting where it may be needed to compact hard, granitic rocks, as before referred to, you will use water only on the top, or binder course.

You will wet this binder course thoroughly before rolling, but not to the extent of saturating the foundation. You will get better results and

prevent the screenings from being picked up by the wheels of the roller if you apply the water and allow it to settle down below the top surface before passing the roller over it. Too much water, or too little, will give trouble by causing the surface to be picked up.

You must not under any conditions roll the screenings while dry.

You must not under any conditions allow teams to pass over the road after the screenings are spread and before they are rolled.

In case of a deficiency in the water supply, you may have the screenings spread and await a rain before rolling; but in such case the road must be entirely closed to travel, and the rolling must be begun as soon as the road is wet and continue until the section covered with screenings is thoroughly compacted. In such cases it may be necessary to operate the roller day and night, and you must insist on this being done. In case you meet with any difficulty in compacting the stone, and fail to understand the cause, report immediately in writing to the office.

Telford. Telfording will be used in all cases where the road passes over clay, or wet soil. You will make a careful study of the road, and report in writing to the chief engineer where in your opinion telfording is needed, giving a description of the soil, together with the general scope of the adjacent ground. In your report you will note the stations between which the telfording may be needed.

Where telford is to be used, you will see that the road bed is excavated and carefully rolled, and left true and even, corresponding to the cross-section, and 12 inches below the established grade of the finished work. You will then cause 2 inches of gravel to be uniformly spread over the sub-grade. On this sub-grade you will place a foundation of stones, which may vary in size as follows: 4 to 10 inches in width, 6 to 20 inches in length, 5 to 6 inches in depth (not more than 10% of the stone to be less than 6 inches in depth). The stone must be sound, and of a quality approved by the chief engineer.

The telford stones shall be placed by hand, vertically, on the broadest edges and lengthwise across the road, so as to form a close, firm pavement. They shall be bound by inserting and driving down, in all places where it is practicable, stone of proper size and shape to wedge them in their proper position. No large stone will be left with a projecting point coming nearer than 4 inches to the finished grade and cross-section. If any such projection be found, it must be broken off to allow a clear depth of 4 inches of broken stone.

The telfording shall then be rolled with a steam roller, all depressions filled with stone chips or spalls, rolled and left true and even and 4 inches below the finished grade and cross-section. If a drain is to be put in, it must be finished after the excavation is made and before the gravel is spread.

Drains. Where telfording is used, or where ground water from a side hill may work injury to the road, you will build drains.

If the road passes through a cut, you will place a drain on each side.

If the road is on a side hill, you will place a drain on the up-hill side only.

All drains must be carried to a proper outlet, either to a culvert, to another drain or through the bank.

Where it is necessary to extend a drain to an outlet beyond the section needed to be drained, you will lay the pipe with cement joints on such extension, and omit the gravel or stone in the trench.

Where a pipe is carried through a bank, the outlet must be protected by masonry, as provided in pipe culverts.

All pipe must be laid true to the line and grade, and no pipe is to be laid on a grade of less than 3 inches in 100 feet.

If in laying out a drain you find the trench is likely to exceed 5 feet in depth below the finished grade, you will immediately report the conditions in writing to the chief engineer.

The center of the pipe in all drains will be placed 12 inches outside of the line of broken stone.

When the grade of the finished road is 3 inches or more to the 100 feet, the bottom of the drain trench must be $3\frac{1}{2}$ feet below the finished surface of the road at that part of the cross-section.

The drain trench will be excavated to a width of 12 inches at the bottom and 15 inches at the top, and should be excavated only as fast as the drain can be finished.

On the bottom of this trench you will place 2 inches of gravel or broken stone which will pass through a $1\frac{1}{4}$ inch mesh and not through a half inch mesh.

All side drain pipe will be 5 inches salt-glazed vitrified clay pipe, with bell and spigot joint (unless stated to the contrary in the specification).

The pipe is to be laid on the grade hereinbefore mentioned, with open joints and the bell end toward the rising grade.

Gravel or broken stone of the sizes already described will be filled about the pipe and over it for a depth of 5 feet. This must be carefully tamped about and rammed over the pipe. The remainder of the trench is to be filled with stone which will pass through a 3 inch and not through a 1 inch mesh. Great care must be taken to prevent any sand, silt or earth from getting into the pipe or the interstices of the stone in the trench.

The sub-grade of the road is to have a regular slope to the edge of the drain.

Gutters. Paved gutters will be built where directed by the chief engineer.

No gutter is to be laid until after the broken stone has been rolled.

In no case is the roller to pass over any part of any paved gutter.

Gutters not exceeding 400 feet in length shall be 3 feet wide with a shoulder 1 foot wide and a dish of 3 inches.

Gutters exceeding 400 feet in length shall increase the dish above this length at the rate of 1 inch to each 300 feet.

All stone used in gutters shall be rounded field, bank or river stone; no flat, shaky or rotten stone shall be used.

The stone may on the average lay from 4 to 6 square yards to the ton. A cubic yard may be estimated to weigh $1\frac{1}{3}$ tons.

The larger selected stone will be laid in the gutter itself and on the edges to a true line and grade, with the largest diameters lengthwise of the road. All other stone will be laid with the longest diameters across the gutter.

The trench shall be excavated to a depth of 12 inches below the finished grade of the gutter; gravel shall then be spread and rammed to a depth of 4 inches. A layer of bedding sand or gravel free from stone larger than $\frac{1}{2}$ inch in diameter shall then be spread of a sufficient thickness to bring the gutter stones which are bedded in it to the proper grade and cross-section after they are thoroughly rammed.

Each stone is to be rammed to an unyielding foundation. The surface shall then be covered with sand or screened gravel, which must be well broomed into all joints. The stone shall then be re-rammed and the surface left true and even. Sand or screened gravel shall then be spread over the entire surface of sufficient depth to fill all interstices.

The edge of the gutter toward the road shall be left $\frac{1}{4}$ inch below the surface of the adjoining broken stone; in no case must it project above it.

Any broken stone which may be disturbed during the paving of the gutter must be carefully replaced and thoroughly rammed.

The bank on the outside of the gutter must be sloped to the gutter, so as to have no bunches or depressions on its surface.

These extracts show the careful attention paid to small details of construction, in the state highway work of Massachusetts.

EARTH ROADS, CONSTRUCTION AND MAINTENANCE

It is not proposed, within the limits of this article, to go into further detail on the subject of road building, as there are already many books in which this subject is adequately treated, especially the construction of Macadam and Telford roads. It seems important however, to call attention to some of the difficulties encountered in maintaining earth roads. If there were no rainfall it would be comparatively easy to make and maintain roads of clay, loam or gravel. Rain, snow and frost are the chief sources of trouble. *Theoretically* by a curved cross-section of road bed the water is caused to flow off, *practically* as soon as the road bed is softened by rain, wheel tracks quickly form longitudinally and prevent the water from escaping except at long intervals. It therefore is of little value to give an earth road a cross-section of pronounced curvature. The nearer flat it is without approaching concavity the wider the bearing of the wheels on the road bed and the less the cutting by them. A slight convexity is desirable to balance the wear along the central line.

In hilly districts where grades are steep, it is of the greatest importance to prevent the water from flowing lengthwise of the road. This is effected inexpensively by making a ridge of earth across the road which turns the water to one side or the other. These ridges, which are called breaks or breakers and in some localities 'thank you ma'ams,' are uncomfortable to drive over and have little durability. On very steep ascents

these breaks are of use in supporting heavily laden wagons while the teams are resting.

The practice of chaining a wheel in descending a steep hill with a loaded wagon, which method provides an inexpensive substitute for a brake, rapidly wears deep ruts in hill roads and in the 'breakers' built across them. This practice is far more destructive than the use of narrow tires and should be prohibited by law as soon as possible. On hill roads where the ascent is not too steep to permit the maximum load to be drawn continuously so that it is not necessary for the team to stop and rest, a very satisfactory substitute for 'breakers' is found in a wooden box drain or sluice placed across the road at a slight angle with the perpendicular, the top consisting of oak slats about 3 in. x 4 in. with a space of about 2 in. between them. These transverse gratings intercept and carry off the water flowing lengthwise of the road, which if allowed to go far would gain in volume and erosive power until serious damage would be done.

A part of the work of the Massachusetts Highway Commission has been to eliminate steep grades from the roads built at state expense. In many cases a change of location has been found necessary to accomplish this end.

A serious cause of wear on roads is the filling of the gutters with snow and ice which often accumulates to such a height as to make the center of the road the principal line of drainage. When this occurs on earth roads, in early spring a large volume of snow-water follows this channel, seriously damaging the road and necessitating much expense in its repair. Even the best type of Macadam or Telford road would eventually be damaged in this way. I am informed by the Massachusetts Highway Commission that it has been found necessary in that State to have the snow removed from the gutters in order to prevent damage of this character. When the gutters are open it is not a difficult matter to remove the snow and ice if sufficient money is provided for the purpose. It is however, the custom in our rural districts to have gutter bridges and box or stone drains at the junction of private roads or minor cross roads with the main highways. When these become clogged with ice as they invariably do, it is impossible to clear them without taking them apart and this is rarely practicable.

In Massachusetts these gutter bridges are prohibited on the new roads, the lateral roads being made to meet the main roads at a very gentle slope, leaving an open gutter which may be driven over without discomfort. With an earth road it would be difficult to maintain such an open

gutter at road intersections unless some person were detailed to keep it in continuous repair. As this has not yet been found practicable on public roads, the gutter bridge is everywhere in use, and in the spring it is a fruitful source of injury to the road. It will be seen from every day observation and from the details stated above that the earth road while as yet all that the people have agreed to have in New York has necessarily many elements of self-destruction and can never be regarded as permanent. The development of the wheel scraper or road machine has made it possible however to keep an earth road in good condition if intelligently used.

For speedways and pleasure driving in general, a well kept earth road in dry weather is superior to all others. The perfect Macadam or Telford road is too hard to permit of very fast driving without injury to the feet of horses.

ROAD MATERIALS AND THEIR DISTRIBUTION

In New York the best materials for road metal are trap, granite and magnesian limestone.

Trap is a general term for some of the basic eruptive rocks, the word being related to or derived from the German *Treppen* which signifies a flight of steps and is suggested by the somewhat regular manner in which the rock is jointed.

The trap which is used in New York for a road metal is a diabase and consists chiefly of the minerals augite and labradorite, the former being a silicate of iron and magnesia and the latter being a lime-soda feldspar. Other minerals are present in small quantity but do not influence the properties which make the rock valuable as a road metal.

While sufficiently hard to resist the wear of heavy traffic to a satisfactory extent it possesses a high degree of binding or cementing power. This means that the dust produced by wear when moistened unites quite firmly and forms a cement which binds the larger fragments to a considerable extent.

This property is most noticeable in rocks containing much lime, magnesia and alumina.

Good trap is known only in Richmond and Rockland counties, and in the intermediate area of New Jersey bordering the Hudson river. Its very prominent outcrop is known as the 'Palisades.'

Granite consists chiefly of quartz mixed with one or more of the feldspars and hornblende or a mica. Hornblende has essentially the same composition as augite which occurs in trap; and a hornblende granite should be a

very good road metal. Where hornblende is absent one would expect to find less binding power.

Granite is harder than trap and therefore should resist wear better, but this quality is offset by its usually smaller binding power due to the presence of quartz so that trap should be preferred as a rule.

Granite is found in the Adirondack region and in the Highlands of the Hudson, also in Westchester county. The commercial term granite includes various kinds of gneiss.

Magnesian limestone has great binding power but is quite soft and therefore not very durable for heavy traffic. Chemically, this rock is chiefly a carbonate of lime also containing carbonate of magnesia, alumina and silica. Limestone entirely free from magnesia is rare.

It has been suggested that this stone may be used profitably as a binder over stone of less binding power.

Limestone is found chiefly in areas parallel to and near the main line of the New York Central railroad and in a zone around the Adirondacks.

Sandstone consists chiefly of quartz, has usually no lime, magnesia or alumina and therefore has no binding properties and never makes a first rate road, as the fragments continually break loose.

In New York the best road materials occur in certain limited areas, and at points distant from these the cost of transportation is the controlling feature in the question of their use.

The accompanying map shows the distribution of the areas of rock already mentioned which are available for road construction in New York.

For high class road building, trap and granite will be preferred and used in all places where their cost is not prohibitory. Experience shows, however, that unless these materials are used under the direction of experienced road engineers, they are less satisfactory than limestone, and when it is proposed to macadamize a road by simply covering it with broken stone, the latter though less durable, will be more satisfactory.

When granite and trap are properly laid, on a well prepared bed and rolled with a heavy steam roller to the proper standard of firmness, nothing can be better, but where no steam roller is available and the subgrade is not properly prepared, the trap and granite are liable to afford only an unpleasant and uneven surface of hard angular fragments which ceaselessly roll about on the surface of the road injuring the horses and making pleasure driving impossible.

Limestone from its softness and greater binding power is more easily rolled into an even surface under the wheels of vehicles, and while not

having the durability to support heavy traffic for a long time, can be cheaply renewed if the source of supply is not far distant. This fact has been recognized for a long time at points within easy reach of the limestone quarries. In Onondaga county at many points a portable crusher has been used to crush for road metal the blocks from the limestone fences which are cheerfully donated by the residents for the improvement of the roads. There are many other counties in which this might be done as may be seen from the map which shows the distribution of the limestone areas. In most of these areas limestone will be found in the fences and may be crushed for road metal at small expense.

The lists of quarrymen and the maps at the end of this bulletin explain the distribution of materials available for road building.

The distribution of road materials may also be studied in greater detail on the Economic Map of New York by F. J. H. Merrill which shows both the geology and the mineral deposits on a scale of 12 miles to 1 inch and on the Preliminary Geologic Map of New York by the State Geologist which shows the geology on a scale of 5 miles to 1 inch.†

In addition to the outcrops and ledges where quarries may be opened the deposits of boulders and gravel which we call glacial drift often yield good materials for road metal at a long distance from the original source. These deposits cannot as yet be mapped but they are usually well known in the regions where they occur.

TESTS OF ROAD MATERIAL

The most practical test of road metal is actual use, and this has been the principal guide in the past; but as the demand becomes greater for new localities of road metal in order to reduce transportation charges, it has become necessary to devise physical tests which may be used in the examination of new materials offered for road building.

The following description quoted from the report of the Massachusetts Highway Commission for 1896, describes in detail the methods in use by that organization.* †

LABORATORY EXPERIMENTS ON ROADBUILDING STONES

The following described results were obtained in the highway laboratory of the engineering department of the Lawrence Scientific School of Harvard University. Those under the head 'Coefficient of abrasion' were obtained by the Deval method, which has been employed for some time by the French engineers for determining the relative value of the

*.Pp. 86-91. † In this quotation, metric weights and measures have been reduced to common forms.

† For Westchester Co. see A Geological Map of a Part of Southeastern New York by F. J. H. Merrill, in Bulletin 15, N. Y. State Museum; also in 48th Ann. Rept. N. Y. State Museum.

stone used in the construction and maintenance of the national highways of France. These results are said to agree well with those obtained in actual practice.

The apparatus used in the tests consists of a cast-iron cylinder 8 in. in diameter and 13.6 in. in depth. At one end is an opening which can be closed with a tightly fitting iron cover. This cylinder is mounted on an axle at an angle of 30° with the axis of the cylinder, and is supported on an iron frame. At one end of the axle is a pulley wheel by which the cylinder is revolved; at the other is an instrument which records its revolution.

The stone to be tested is first broken into pieces, between $2\frac{1}{2}$ in. and $1\frac{1}{4}$ in. in diameter, which are carefully washed, to remove any foreign matter. In the cylinder are placed 5 kilograms ($11\frac{1}{2}$ lbs.) of this stone. The top is then bolted on, and the cylinder is made to revolve for 5 hours at the rate of 2,000 revolutions an hour, making in all 10,000 revolutions. By this process the stones are thrown from one end of the cylinder to the other, and at the same time are roiled against the sides of the vessel and against one another. When 10,000 revolutions are completed, the cover is removed, and the contents emptied into a tray. The cylinder is then thoroughly washed, to remove the dust that adheres to its sides. Each stone above $1\frac{1}{4}$ in. in diameter is then washed under the same water. This water is then filtered, and the filtrate when dry is mixed with the detritus taken from the cylinder. The detritus is then put into a sieve, by which it is separated automatically into seven sizes. These seven sizes, together with the stones that have not been worn below 3.18 cm. in diameter, are each carefully weighed, and their weights recorded.

The amount of detritus under 1-16 in. is rarely less than 20 grams per kilogram of stone used 2 %, therefore 20 has been adopted as the standard, and the coefficient of quality is obtained by the following formula:

$$q = 20 \times \frac{20}{u} = \frac{400}{u} \quad u = \text{per cent}$$

in which u represents the weight in grams 15.43 grs. of detritus per kilogram (2 2-3 lbs) of stone.

It seemed well, in beginning this work, to be guided as far as possible by the experience of others, and for this reason the Deval test was adopted, for it appeared to be the only practical method of testing road metals yet devised. After a number of trials were completed with the Deval apparatus, and their results studied, it was recognized that all the valuable properties possessed by a good road metal were not embraced in this test. The value of any good stone as a road metal is due to certain properties possessed by it. Among these there are three which stand prominent — cementing value, toughness and hardness. It is evident that the Deval apparatus does not test the very important property of cementing value in the different road metals. The commission, recognizing this deficiency, accordingly directed its attention to devising some means of supplying it. As no previous attempt has been made in this direction, the commission had to invent its own method, which is as follows:

The stone to be tested is ground to a powder, and passed through a sieve of 100 meshes to 1 m. The powder is then put in a slightly tap-

ered steel die of circular section, about $1 \frac{1}{4}$ in. diameter, mixed with water, and subjected to a pressure of 2,300 kilograms (about 3 tons). The resulting briquette is then put aside for at least one week, so that it may thoroughly dry.

It was at first thought that a test by direct compression would determine the cementing power of the stone. A number of briquettes were tried in this way, but the results were not very satisfactory. On further consideration, it appears that a test by impact would more thoroughly determine the cementing power of the stone than that by compression, and this method would have the further advantage of approximating more closely to the actual conditions obtaining on roads; accordingly a machine was devised for testing the briquettes by impact. With this machine a hammer one kilogram (2 2-3 lbs) in weight can be dropped freely from any desired height upon a plunger under which the briquette to be tested is placed. The hammer works automatically and is tripped at the desired height. Attached to the plunger is a lever, pivoted at one sixth of its length from the plunger, and carrying a pencil at its free end. The pencil has a vertical movement five times as great as that of the plunger, and its movement is registered on a drum against which the pencil presses. The drum rotates through a small angle at each stroke of the hammer. An automatic diagram is thus taken of the behavior of the briquette throughout the whole test.

An analysis of the diagram so taken shows at once the number of blows required to cause the destruction of the briquette. A very interesting point is brought out by these diagrams, viz, in every case the diagram shows that the plunger rebounded at each stroke until the briquette began to fail. This behavior is exactly analogous to the elastic phenomena observed in all material of construction; consequently the point at which the briquette ceases to rebound corresponds to the elastic limit of the material. Beyond this point the briquette falls to pieces rapidly.

Briquettes were made from many kinds of stone, and were tested in this machine. It was thought desirable to use a constant blow for all the briquettes, and a short experience indicated a fall of $1 \frac{1}{4}$ in. as suitable, since it broke the most tenacious materials with a moderate number of blows, and yet was not too great to permit the careful determination of the properties of the poorer stones. All the briquettes were 1 in. high.

The surface of a macadamized road is constantly being abraded and recemented. Evidently a road made from a material which has the property of recementing in a high degree will keep in better condition than one made from a material of lower recementing power. It was therefore desirable to determine the recementing properties of the stones tested. A new set of briquettes was made, differing from the former only in that they were of constant weight instead of constant height. These were tested in the manner described above, and then were remade and retested.

It has not been thought desirable to present herewith the complete data obtained from the impact test: as the series is not yet completed. The writer has, however, collected and shown in the accompanying table some of the more important results thus far obtained, a sufficient number to indicate the scope of the work done. In this table the stones are arranged in the order of their power of resisting abrasion. Column 1

contains the specific density of the stones; column 2, the coefficients of abrasion (determined in the manner previously described); the next column gives the number of blows required to stress the 1 in. briquettes to their elastic limits; column 4 gives the same data for the first testing of the 30 gram (463) briquettes prepared for the recementation test, and the next column gives the number of blows that the recemented briquettes will stand before reaching their elastic limits."

Through the courtesy of the commission six specimens of typical New York rocks were subjected to the abrasion test with results which are noted in the following table; which also gives the results of some tests of Massachusetts rocks.

Table showing specific densities, coefficients, cementing values and recementing values of stones tested

NAME OF STONE	City or town	1		2	3		4	5
		Specific density			Cementing value			
<i>* Massachusetts rocks</i>								
Diabase	Lynn, Essex co., Mass.	3 03		20 37	.....		56	29
Felsite	Boston, Suffolk co., Mass. ....	.....		16 06	.....	23	109	31
Hornblende granite	Duxbury, Plymouth	2 68		13 46	.....		
"	Waltham, Middlesex co., Mass.	2 62		12 16	.....	16		
Gneiss	Lee, Berkshire co., Mass. ....	.....		11 43	.....	23		
Limestone	Pittsfield, Berkshire co., Mass.	2 82		9 38	.....	15		
Quartzite	Diamond Hill, Cumberland, R. I. ....	.....		9 07	.....	9		
Marble	Lee, Berkshire co., Mass.	2 74		2 85	.....		
<i>† New York rocks</i>								
Diabase, Bouker	Guttenberg, N. J. ....	.....		30 40	.....		
"	Rockland Lake, N. Y. ....	.....		17 79	.....		
Conklin & Foss	Cortland, Westchester co. ....	.....		7 46	.....		
Norite	Round Island, Rockland co. ....	.....		23 02	.....		
Granite, D. Donovan	Lockport, Niagara co. ....	.....		17 48	.....		
Silicious sandstone	Duanesburg, Schenectady co. ....	.....		10 53	.....		
Sandstone	Howes Cave, Schoharie co. ....	.....		9 64	.....		
Limestone	Tomkins Cove, Rockland co. ....	.....		6 31	.....		
"								

* From the Report of the Mass. Highway Com. 1906.

† Tests made for the New York State Museum by the Mass. High. Com.

As shown by the preceding table, the New York rocks tested in the laboratory of the Massachusetts Highway Commission were only subjected to the abrasion test and therefore the results can not be fully compared with the tests of the Massachusetts rocks which are given above. Two samples of traps were tested, one from the Bouker quarry at Guttenburg and one from the quarry of Conklin & Foss at Rockland Lake. The specimen tested from the Bouker quarry proved to be very much harder than that from the Conklin & Foss quarry. There are two varieties of trap found in the Bouker quarry; one being considered of inferior quality and known by the quarrymen as "*false trap*." It is part of the lower portion of the trap mass and being near the sandstone which forms its lower foundation, it cooled more rapidly and assumed a finer texture and a harder condition than the mass above. Although this so-called false trap has not been subjected to a cementation test, one would expect it to prove equally valuable with the rest in this respect, as its chemical composition is probably nearly identical with that of the softer trap immediately adjoining. It was a sample of the "*false trap*" which was tested.

It is stated that where used at some points on Long Island it has proven unsatisfactory, the fragments not holding together and forming an even surface, but frequently flying out.

The attention of the writer has been called to this fact, but he has not sufficient information to warrant a full expression of opinion. The difficulty may be due to improper construction in building the road. It might also be due to the mixture of this harder variety of trap and softer material from the same quarry, it being well established by experience that unless the road-metal in the surface layer is of uniform hardness, it will not wear uniformly. To establish the truth in this case would involve a good deal of experimental work for which no funds are available, but theorizing on the facts accessible, there seems no reason why the harder trap or false trap should not make a good road provided it is kept separate from material of different hardness and is laid under the supervision of a competent engineer.

As a rule when it is not possible to make numerous tests and experiments, it will be cheaper to use those materials which have proven satisfactory in actual use.

Owing to the press of state work it was not possible for the Massachusetts commission to make cementation tests of the specimens submitted. The tests made, confirm the results of practical experience and show that granite, trap and sandstone are harder and offer more resistance to abrasion than the limestones. The cementation test, when made, would unquestionably show the highest cementing value to be in the limestone, trap and granite and the lowest in the sandstone.

PRODUCERS OF ROAD-METAL IN NEW YORK STATE

Limestone

P. C. denotes that the stone is crushed in a public crusher owned or hired by the town or village. The number in the column headed *test* is the coefficient of abrasion as determined in the laboratory of the Massachusetts Highway Com.

NAME	Test	Town or village	County
Allter Bros.....		St Johnsville.....	Montgomery
Alvord, A. E.....		Manlius.....	Onondaga
Babcock, Dwight.....		Waterloo.....	Seneca
Barber Asphalt Paving Co.....		Buffalo.....	Erie
Behan's Estate, James.....		Manlius.....	Onondaga
Bennett, J. & Son.....		Auburn.....	Cayuga P. C.
Britton & Clark.....		Onondaga.....	Onondaga
Brown & Fleming.....		Verplanck.....	Westchester
Buffalo Cement Co.....		Buffalo.....	Erie
Callanan Road Imp. Co.....		South Bethlehem.....	Albany
Chaumont Co. (The).....		Chaumont.....	Jefferson
Chazy Marble Lime Co.....		Chazy.....	Clinton
Conley, F. E.....		Oriskany.....	Oneida
Driscoll Bros. & Co.....		Ithaca.....	Tompkins
Dunlap & Co., R.....		Jamesville.....	Onondaga P. C.
Foery & Kastner.....		Rochester.....	Monroe
Hibbard, John P.....		East Onondaga.....	Onondaga
Howard, John F.....		Ogdensburg.....	St Lawrence P. C.
Howe's Cave Association.....	4.15	Howe's Cave.....	Schoharie
Hudson River Stone Supply Co.....		Stoneco.....	Dutchess
Jones, Hadley.....		Littlefalls.....	Herkimer
Lauer & Hagaman.....		Rochester.....	Monroe
Lynde, B. A.....		Bellevue.....	Erie
Miller, Geo. W. & D. C.....		Newburgh.....	Orange
Mohawk Valley Stone Co.....		Palatine Bridge.....	Montgomery
Newark Lime & Cement Mfg. Co.....		Rondout.....	Ulster
Ransier, Huestis B.....		Maulius.....	Onondaga
Roberts, R. W.....		Collinsville.....	Lewis P. C.
Shute & Rightmyer.....		Hudson.....	Columbia
Smith, W. T.....		Sharon Springs.....	Schoharie
Snyder, C. G.....		Aquetuck.....	Albany
Solvay Process Co.....		Onondaga.....	Onondaga
Stainthorpe, C. N.....		Lockport.....	Niagara
Tomkins Cove Stone Co.....	6.34	Tomkins Cove.....	Rockland
Wagar, Isaac F.....		Milton.....	Saratoga
Whitmore, Rauber & Vicinus.....		Rochester.....	Monroe
Worlock, Cyrus.....		Perryville.....	Madison

Granite

Anusable Granite Co., B. B. Ma- son, agent.....		Keeseville*.....	Essex P. C.
Bellew & Merritt Co.....		Tuckahoe.....	Westchester
Donovan, Dan'l E.....	1.73	Round Island ^a town of Stony Point...	Rockland
Rampe Bros.....		Pine Island, town of Warwick.....	Orange
Smith, Hay.....		Garrison.....	Putnam
Thousand I. Granite Co.....		Griudstone Island town of Clayton..	Jefferson

* This rock is technically a *norite*

^a Near Iona Island

PRODUCERS OF ROAD-METAL, Etc., concluded.

Trap

NAME	Test	Town or village	County
Bennett, Frank.....	.....	Port Richmond	Richmond
Conklin & Foss.....	2.25	Rockland Lake	Rockland

New York firms having quarries in New Jersey

Bouker Contracting Co.....	1.31	Guttenberg	Hudson Co., N. J.
Carpenter Bros.....	.....	Guttenberg.....	" N. J.
Lane, John S. & Son .....	.....	Fort Lee	Bergen Co., N. J.

Sandstone

Albion Stone Co.....	.....	Albion	Orleans
Conley, F. E .....	.....	Higginsville	Oneida
Fowles, Joseph.....	.....	Ithaca	Tompkins
Shear, Albert & Co.....	3.80	Duanesburg	Schenectady
Swett, A. L.....	.....	Medina	Orleans
Whitmore, Chas	2.29	Lockport.....	Niagara

DIRECTORY OF QUARRYMEN IN NEW YORK STATE

Arranged in alphabetical order by post-office addresses

† Proprietors of quarries operating previous to 1897; now idle.
 * Proprietors of quarries operating in 1897.

Parties not marked with dagger or asterisk have not been heard from directly, but are reported to be operating.

B. S. = Building stone

R. M. = Road metal

L. = Lime

C. = Cement

M. = Marble

P. C. = Public crusher

Granite

POST-OFFICE ADDRESS	NAME	LOCATION OF QUARRY	
		Town or village nearest to the quarry	County
Cold Spring.....	Bailey, C. W.*.....	Phillipstown.....	Pulnam B. S.
".....	Bailey, James E.†.....	".....	"
Garrison.....	Smith, Hay*.....	".....	B. S. & R. M.
Gloversville.....	Edel, John*.....	Johnstown.....	B. S.
".....	Wright, John.....	".....	"
Goshen.....	Empire State Granite Co.*.....	Pine Island.....	B. S.
Keeeseville.....	Anselme Granite Co. (B. B. Mason, agt.)*.....	Chesterfield.....	B. S. & R. M., P. C.
New York.....	Donovan, Daniel E.*.....	On Round Island, town of Stony Point.....	Rockland B. S. & R. M.
Montreal.....	Thousand I. Granite Co.†.....	Thurso.....	Jefferson B. S. & R. M.
Peekskill.....	Mohegan Granite Quarrying Co.*.....	Cortland.....	Westchester B. S.
Pine Island.....	Rampe Bros*.....	Warwick.....	Orange B. S. & R. M.
Suffern.....	Rice Bros.....	Ramapo.....	Rockland
Thurso.....	Kelly Granite Co.*.....	Clayton.....	Jefferson B. S.
".....	Potter, O. L.†.....	".....	B. S.
".....	White, Burgess & Co*.....	".....	B. S.
Tuckahoe.....	Bellew & Merritt Co*.....	Tuckahoe.....	Westchester B. S. & R. M.

Gneiss (Granite)

Croton Falls	Gaung, Edwin C†	Carmel	Putnam	B. S.
Hartsdale	Butler, C	Hartsdale	Westchester	B. S.
"	Dolba, G. W.	"	"	B. S.
"	Hitchcock, Welcome G.	"	"	B. S.
"	Landers, J. H.	"	"	B. S.
"	Wilson, J. C.	"	"	B. S.
Hastings	Nichols Henry*	Greenburg	"	B. S.
Littlefalls	Littlefalls and Dolgeville R.†	Littlefalls	Herkimer	R. M.
Scarsdale	Seely, Henry S†	"	"	B. S.
Tarrytown	Sackett, Stephen J. (estate)*	"	"	B. S.
Trap				
Haverstraw	Conklin & Foss*	Rockland Lake	Rockland	R. M.
Port Richmond	Bennett, Frank*	Northfield	Richmond	R. M.
New Jersey quarries supplying New York				
Guttenberg, N. J.	Lane, John S. & Son*	Guttenberg	Hudson	B. M.
New York city	Bonker Contracting Co.*	"	"	B. M.
Port Chester, N. Y.	Carpenter Bros*	Fort Lee	Bergen	B. M.

Limestone

Accord	Bennett, John*	Rochester	Ulster	B. S.
"	Krom, George*	"	"	L.
"	Longendyke, A. N.	"	"	"
"	Rose, W. H.	"	"	"
"	Wakeman, J.*	"	"	B. S.
Akron	Akron Cement Co.*	Newstead.	Erie	C.
"	Newman, H. L. & W. C.*	"	"	B. S., C.
Albany	Callanan Road Imp. Co.*	South Bethlehem	Albany	R. M.
Albion	Staines, Thomas F.*	Barre	Orleans	L.
Amsterdam	Hewitt, D. C.*	Amsterdam	Montgomery	B. S., L.
"	Vanderveer, T. B.*	"	"	B. S., L.
Aquetuck	Snyder, Carl*	Coeymans	Albany	R. M.
Anbun	Bennett, J. & Son*	Anbun	Cayuga	B. S., B. M., P. C.
"	Goodrich, L. S. & Son	"	"	B. S.
Batavia	Berthum, August	Batavia	Genesee	"
"	Merrill, John*	"	"	B. S., L.
Bigelow	Williams, Charles & Co.*	De Kalb	St Lawrence	L.

DIRECTORY OF QUARRYMEN IN NEW YORK STATE - LIME-STONE - (Continued)

POST-OFFICE ADDRESS	NAME	LOCATION OF QUARRY	
		Town or village nearest to the quarry	County
Boonville.....	Lee, Albert J.*	Boonville.....	Oneida
Brasie Corners	Fleming, Walter.....	Macomb.....	St Lawrence
".....	Hall, K. G.	".....	"
Bellevue.....	Lynde, B. A.*	Bellevue.....	Erie
Brooklyn.....	Flynn, P. H.*	Sangeries.....	R. M.
Buffalo.....	Ambrose, E. J.....	Buffalo.....	B. S.
".....	Armbruster, Joseph.....	".....	"
".....	Barber Asphalt Paving Co.*	".....	B. S.
".....	Buffalo Cement Co. (lim.)*	".....	R. M. & C.
".....	Consumer's Lime Co.....	Clarence.....	"
".....	Cumming's Cement Co.....	Newstead.....	B. S.
".....	Cutter & Bailey*.....	Buffalo.....	C.
".....	Fogelaenger, D. R. & H.....	Buffalo.....	B. S.
".....	Gehres, Anna*.....	Buffalo.....	B. S.
".....	German Rock Asphalt Co.....	Lockport.....	"
".....	Gesl, John Jr.....	Buffalo.....	Niagara
".....	Grattan & Jennings.....	".....	Erie
".....	Kabel, Martin*.....	".....	"
".....	Kebr, A. F.*.....	Clarence.....	B. S.
".....	Straub, Peter G.....	".....	B. S.
Burlington, Vt.....	Burlington Mfg. Co.t	Port Henry.....	L.
Canajoharie.....	Allen, William.....	Canajoharie.....	Essex
".....	Rapp, G.....	".....	Montgomery
".....	Shaper, A. E. & D. C.....	".....	"
Canandaigua.....	McNulty, Frank*.....	Canandaigua.....	B. S.
Canton.....	Stevens, E. E.....	Canton.....	B. S.
Catakill.....	Palmer, H. P.*.....	Catakill.....	Ontario
Cazenovia.....	Burr, J. T.....	Fenner.....	St Lawrence
Chaumont.....	Adams & Dufort.....	Chaumont.....	Greene
".....	Chaumont Company.....	Lyme.....	L.
".....	".....	".....	Madison
".....	".....	".....	Jefferson
".....	".....	".....	"
".....	".....	".....	B. S., R. M., L.

Chazy	Chazy Marble-Lime Co.*	Chazy	Clinton	B. S., R. M., L.
"	Goss, L. M.	"	"	L.
Cherry Valley	Bastian, William	Cherry Valley	Otsego	L.
"	Eldridge, O. H.†	"	"	L.
Chittenango Falls	Keeler, Charles	Fenner	Madison	L. & C.
"	Tooke, D. J.*	"	"	B. S.
"	Winchell, W. M.	"	"	B. S.
Clayton	Denney, Leander*	Clayton	Jefferson	B. S.
Climax	Haswell, D. G.	Coxsackie	Greene	L.
Cobleskill	Haard, Frank*	Cobleskill	"	B. S.
"	Brandenstein, John*	"	"	B. S.
"	Reilly, William*	"	"	L.
Collinsville	Jones, Hugh D.	West Turin	Lewis	L.
"	Potter, M. N.	"	"	R. M., L.
"	Roberts, R. W.*	"	"	"
"	Whittlesey, Walter	"	"	"
"	Williams, B. B.	"	"	"
Columbia	Manning, A.	Columbia	Herkimer	L.
Coxsackie	Day, Ambrose	Coxsackie	Greene	L.
Cranberry Creek	Kegg, Willard	Northampton	Fulton	L.
"	Warren, Willis E.	"	"	"
Crary Mills	Church, Ashley	Potdam	St Lawrence	L.
Dolgeville	Dolge, Alfred*	Oppenheim	Fulton	B. S.
Dover Plains	Bensen, Geo. V.	Dover	Dutchess	"
East Onondaga	Hibbard, John P.*	Onondaga	Onondaga	B. S. & R. M.
East Pitscairn	Van Fatten, F. A.*	Pitscairn	St Lawrence	L.
Ellenville	Van Dermark, B.	Wawarsing	Ulster	L.
Fayetteville	Bangs & Gaynor*	Manlius	Onondaga	C.
"	Ransier, Huestis B.*	"	"	B. S. & R. M.
"	Sheedy, Thomas W.	"	"	C.
Fort Edward	Harris, John F.*	Whitehall	Washington	B. S.
Franklin Iron Works	Juhl, M.*	Augusta	Oneida	B. S.
Glens Falls	Glens Falls Co.*	Queensbury	Warren	L., B. S., M.
"	Jointa Lime Co.*	"	"	L., B. S.
"	Morgan Lime Co.*	Moreau	Saratoga	L.
"	Reynolds & Riordan*	Queensbury	Warren	B. S.
"	Sherman Lime Co.	"	"	L.
Gloversville	Mayfield Lime Co.	Mayfield	Fulton	L.

DIRECTORY OF QUARRYMEN IN NEW YORK STATE — LIMESTONE — (Continued)

POST-OFFICE ADDRESS	NAME	LOCATION OF QUARRY	
		Town or village nearest to the quarry	County
Gouverneur	Abbott, J. B.	Gouverneur	St Lawrence L.
"	Empire Marble Co.	"	" M.
"	Gouverneur Marble Co.*	"	" M. B. S.
"	Northern New York Marble Co.*	"	" M.
"	Potter, Charles A.	"	" M.
"	St Lawrence Marble Co.	Fowler	" M.
"	Wright, H. J.	Gouverneur	" M.
Greenwich	Bennett, H. C.*	Fowler	" L.
Harris Hill.	Fiegle, August	Greenwich	Washington B. S.
Harriaville.	Brady, Mary*	Clarence.	Erie L.
Hart Lot.	Carrigan, P. C.	Diana	Lewis L. B. S.
"	Heavern, Charles	Elbridge	Onondaga
"	Gorham, Aaron	"	"
"	Keenan, John	"	"
Hickory	Ingram, Villast	Macomb	St Lawrence L.
"	Petin, Wm.	"	" L.
Holland Patent	Hillidge, James G.	Trenton	B. S.
Hoosick Falls.	Carey, William	Hoosick	B. S.
"	Dolan, John*	"	B. S.
"	McCauley, Cornelius*	"	B. S.
Howe's Cave	Howe's Cave Assn.*	Cobleskill	B. M., B. S., L. & C.
"	Howe's Cave Lime & Cement Co.*	"	B. S., L. & C.
Hudson	Shute & Rightmyer	Jonesburg & Hudson.	B. S., R. M.
Ingham Mills.	Bailey, Sherman	Manheim	B. S., R. M.
Ithaca	Driscoll Bros. & Co.*	Ithaca	B. S. & R. M.
Jamesville.	Alvord, E. B. & Co.*	Dewitt & Lafayette.	B. S., L. & C.
"	Dunlap, R. & Co.*	Dewitt	B. M. & C., P. C.
Johnson.	House, Samuel*	Johnson	L.
Jonesburg	Jones, Fred W.*	Greensport	B. S. & M.

Joy.....	Horn, William.....	Sodus.....	Wayne
Katsbaau.....	Fiero, William.....	Saugerties.....	Ulster
".....	Valk & Beers*.....	".....	"
Kerhonkson.....	Gordon, E. H.....	Rochester.....	"
Kingston.....	Noone, Luket.....	Kingston.....	Ulster
LeRoy.....	Heinlich, John.....	LeRoy.....	Genesee
".....	Holmes, George H.*.....	".....	"
".....	Howell, Livingston H.*.....	".....	"
".....	Morris & Strobel.....	".....	"
".....	Pangrazio Bros.*.....	".....	"
Leyden.....	Auer, Melchior*.....	Leyden.....	Lewis
Lincoln.....	Gould, T. O.....	Walworth ?.....	Wayne
".....	Hanson, William.....	".....	"
Littlefalls.....	Jones, Hadly*.....	Manheim.....	Herkimer
Lockport.....	Heary, M. F.....	Lockport.....	Niagara
".....	Levalley, W. B.....	".....	"
".....	Lockner, William E.*.....	".....	"
".....	Lockport Stone Co.*.....	".....	"
".....	Stainthorpe, C. N. & Co.....	".....	"
".....	Tuohey, P. H.*.....	".....	"
".....	Upson, W. H.....	".....	"
".....	Watson, T. G.*.....	".....	"
".....	Whitmore, Charles*.....	".....	"
".....	Wilson, John H.*.....	".....	"
".....	Woodward & Son.....	".....	"
Lowville.....	Babcock, William L.....	Lowville.....	Lewis
".....	Carter, L. H.....	".....	"
".....	Gowdy, Hiram.....	".....	"
".....	Lyman, M. M.*.....	".....	"
".....	Waters, John M.....	".....	"
Lyons Falls.....	Post, Orville.....	West Turin.....	"
Manlius.....	Behan, James, estate of*.....	Manlius.....	Onondaga
".....	Brown Cement Co.....	".....	"
".....	Malley, William*.....	".....	"
Marcellus.....	Walker, Laura E.....	Marcellus.....	"
Mayfield.....	Warner, S. B.....	Mayfield.....	"
Metacahonts.....	Gray, Stephen.....	Rochester.....	Fulton
Middle Falls.....	Bates, H. B.*.....	Greenwich.....	Ulster
".....	Cipperly, John.....	".....	Washington
".....	".....	".....	Washington

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DIRECTORY OF QUARRYMEN IN NEW YORK STATE — LIMESTONE — (Continued).

POST-OFFICE ADDRESS	NAME	LOCATION OF QUARRY	
		Town or village nearest to the quarry	County
Middle Falls.....	Grouty, James M.....	Greenwich.....	Washington B. S.
".....	Kenyon, Ambrose.....	".....	"
".....	Sullivan, Patrick.....	".....	"
Middleville.....	Mosher, W. W.*.....	Newport.....	Herkimer B. S.
Mill Grove.....	Shoff, B. O.*.....	Mill Grove.....	Erie L.
Mohawk.....	Humphrey, J. W.*.....	Columbia.....	Herkimer L.
Munnsville.....	Adams, Frank*.....	Stockbridge.....	B. S.
".....	Palmiter, Amos*.....	".....	B. S. & L.
Natural Bridge.....	Ashcraft, F. E.*.....	Diana.....	Lewis L.
".....	Hall, E. & W.*.....	Wilna.....	Jefferson L.
Newark, N. J.....	Anderson & Moynihan*.....	Newcomb.....	Essex L.
Newburgh.....	Brown, David*.....	Newburgh.....	B. S. & L.
".....	Miller, Geo. W. & D. C.....	".....	L. R. M.
Newcomb.....	Sayre, James R. jr. & Co*.....	Kingston.....	B. S., L.
Newport.....	Higgins, Gilbert.....	Newport*.....	Herkimer
".....	Morey, Newell.....	".....	"
".....	O'Connor, George H.*.....	".....	B. S.
".....	Sherman, John.....	".....	"
".....	Touney, Daniel.....	".....	"
New York.....	Durycor Portland Cement Co.....	Montezuma.....	Cayuga
".....	Newark & Rosendale Lime & Cement Co.*.....	Whiteport.....	Ulster L. & C.
".....	O'Connell & Hillery.....	Tuckahoe.....	Westchester L.
".....	Snowflake Marble Co.*.....	Pleasantville.....	" M. & L.
Niagara Falls.....	Messing, Bernard.....	Niagara.....	Niagara L.
".....	O'Rourke, Michael.....	".....	"
North Litchfield.....	Davis, Albert R.....	Litchfield.....	Herkimer L.
".....	Dickson, Charles.....	".....	"
".....	Holland, George E.*.....	".....	L.
".....	Salisbury, John E.*.....	".....	"

North Western.....	Vale, John D.....	Western.....	Oneida.....	L.....
".....	Van Dyke, John H.*.....	".....	".....	B. S.
Norwood.....	Hale, George W.*.....	Potsdam.....	St Lawrence B. S.	B. S.
".....	Murray, James L.....	".....	".....	B. S.
Ogdensburg.....	Howard, John F.*.....	Oswegatchie.....	St Lawrence R. M., B. S. & L.	B. S. & L.
".....	Nevin, John H.....	".....	".....	B. S.
Onondaga Castle.....	Kelly Bros.....	Onondaga.....	Onondaga B. S.	B. S.
".....	McElroy & Sons.....	".....	".....	B. S.
".....	Storrier Bros*.....	Augusta.....	Oneida.....	B. S.
Oriskany Falls.....	Putnam estate.....	Palatine.....	Montgomery B. S. & R. M.	B. S. & R. M.
Palatine Bridge.....	Mohawk Valley Stone Co*.....	Sullivan.....	Madison.....	L. & C. R. M.
Perryville.....	Hodge, Mrs. F. W.....	".....	Ontario.....	B. S.
".....	Worlock, Cyrus*.....	Phelps.....	".....	L.
Phelps.....	Edson, B.....	".....	Orange.....	L.
".....	Johnson, William H.....	Warwick.....	".....	L.
Pine Island.....	Brown, B. T.....	".....	Clinton.....	B. S.
".....	Elston, Charles t.....	Plattsburg.....	".....	L.
Plattsburg.....	Behan, Hugh.....	Peru.....	".....	B. S.
".....	Pray, G. W.....	Plattsburg.....	Dutchess.....	L.
Pleasant Valley.....	Robinson, Thomas.....	Pleasant Valley.....	Westchester M. & L.	L.
Pleasantville Station.....	Russell, Evert t.....	Mount Pleasant.....	Herkimer.....	B. S.
Prospect.....	Cornell Lime Co*.....	Russia.....	Oneida.....	B. S.
".....	Talcott, Charles L.....	Trenton.....	Dutchess.....	B. S.
Poughkeepsie.....	Thomas, Evan T*.....	Dover.....	".....	B. S.
".....	Bain, F. R.....	".....	Albany.....	B. S.
".....	Hufcut, H. D.....	".....	".....	B. S.
".....	Lawlor, Michael.....	Coeymans.....	".....	B. S.
Ravena.....	Day, Abraham.....	".....	".....	B. S.
".....	DeFries, W. V. D. H*.....	".....	".....	B. S.
".....	Hotelling, David.....	".....	".....	B. S.
".....	Hughes, William*.....	".....	".....	B. S.
Rochester.....	McClulloch, Conrad.....	Rochester.....	Monroe.....	R. M. & B. S.
".....	Foery & Kastner*.....	".....	".....	R. M. & B. S.
".....	Lauer & Haganan*.....	".....	".....	B. S. & L.
".....	Nellis, J. B. (administrator).....	Gates.....	".....	L.
".....	Neuman, R. G.*.....	Union Springs.....	Cayuga.....	B. S.
".....	Smith, B. P.*.....	Rochester.....	Monroe.....	B. S. & R. M.
".....	Whitmore, Rauber & Vicinus*.....			

DIRECTORY OF QUARRYMEN IN NEW YORK STATE LIMESTONE — (Continued).

POST-OFFICE ADDRESS	NAME	LOCATION OF QUARRY	
		Town or village nearest to the quarry	County
Rondout	Gross, F. W.	Kingston	Ulster
"	Lawrence Cement Co. *	"	"
"	Newark L. & C. Mfg. Co. *	"	"
Rosie	New York & Rosendale Cement Co. *	Rosendale	R. M. L. & C.
Sandy Hill	O'Brien, John *	Rosie	"
"	Drake & Stratton Co. (limited)†	Queensbury	St Lawrence L.
"	Monty, Higley & Co. *	Kingsbury	Warren
Saratoga Springs	Sturtevant, D.	South Glens Falls	Washington B. S.
"	Slade, Charles G. *	Greenfield	Saratoga
"	Wagar, Isaac F. *	Milton	B. S.
"	Wing, Prince; estate	"	"
Sauquoit	Thurston, W. W.	Paris	L.
Schoharie	Becker, Clinton L.	Schoharie	Oneida
Seneca Falls	Brown, Albert *	"	Schoharie
Sharon Springs	Fisher, John	Fayette	Seneca
"	Mallett, F. C.	Sharon	B. S. & L.
"	Smith, Henry S. *	"	Schoharie
"	Smith, Jefferson†	"	"
"	Smith, W. T.	"	L.
Shelby	Simonds, E. B.†	Shelby	B. S.
Sing Sing	Ossining Lime Co. *	Ossining	B. S. & R. M.
Skaneateles Falls	Starr, Levi	Sennett	L.
Smith's Basin	Keenan Lime Co. *	Kingsbury	Westchester L.
Smith's Landing	Nichols, D. & Son	Hartford	Cayuga
"	Gould, J. H. *	"	B. S.
"	Massino, William	Catakill	Washington L.
Sodus Center	Mather, E. B. & Co. *	Sodus	L.
"	Munn, Gardner A. *	"	Greene
South Greenfield	Wing, Elihu	Milton	B. S.
Split Rock	Connors, James	Onondaga	Wayne
			L.
			Saratoga
			Onondaga
			B. S.

Split Rock	Crowley, Cornelius*	Onondaga	Onondaga	B. S.
Springfield Center	McDonough, William*	Springfield	Otego	B. S.
St. Johnsville	Altier, Bros.*	St. Johnsville	Montgomery	B. S., R. M.
"	Fitzer, C.*	"	"	B. S.
"	Hilligar, Chas.	"	"	"
"	Fox, D.	"	"	"
"	Nagle, Thomas.	"	"	"
"	Place, Daniel.	"	"	"
"	Smith, Albert A.	"	"	"
"	Smith, W. C.*	"	"	L.
Stoneco.	Hudson R. Stone Supply Co.	Stoneco.	Dutchess	B. S.
Stone Ridge	Basten, John*	Marbletown	Ulster	R. M.
"	Davenport, Solomon*	"	"	B. S. & L.
Syracuse	Alvord, A. E.	Manlius	Onondaga	L.
"	Britton & Clark	Onondaga	"	L., G., R. M.
"	Hughes Bros.*	"	"	L. & R. M.
"	Thomas, C.*	"	"	B. S.
"	Solvay Process Co.*	"	"	B. S.
"	Wadsworth, George*	"	"	B. S. & R. M.
Three Mile Bay	Barron, John J.*	Lyme	Jefferson	B. S.
Thurman	Pelletier, John	Thurman	Warren	B. S.
Ticonderoga	Joubert, Israel*	Bolton	Rockland	B. S.
Tomkins Cove	Tomkins Cove Stone Co.	Tomkins Cove	Putnam	R. M.
Towner's	Penny, P. D.*	Patterson	Montgomery	B. S.
Tribe's Hill	Hurst, Henry & Son	Mohawk	"	"
"	Putman, J. G.	"	"	"
"	Shanahan, James	"	"	B. S.
Troy	Cheney, W. D. & Son	Smith's Basin	Washington L.	Washington L.
Tuckahoe	New York Quarry Co.	Eastchester	Westchester M.	Westchester M.
"	Norcross Bros.	"	"	"
"	Tuckahoe Marble Co.	"	"	M.
"	Young, James S.	"	"	M.
Union Springs	Shalebo, J. L.	Springport	Cayuga L.	Cayuga L.
"	Wood, George P.*	Hamburg	"	L.
Utica	Callahan, Ed.*	Trenton	Oneida	B. S.
"	Conley, F. E.	Oriskany Falls	"	B. S.
Verplanck	Brown & Fleming*	Verplanck	Westchester R. M.	Westchester R. M.
Walworth	Mann, Owen	Walworth	Wayne L.	Wayne L.

DIRECTORY OF QUARRYMEN IN NEW YORK STATE — LIMESTONE — (Continued).

POST-OFFICE ADDRESS	NAME	LOCATION OF QUARRY	
		Town or village nearest to the quarry	County
Walworth	Read, John*	Walworth	Wayne L.
Waterloo	Babcock, Dwight*	Fayette	Seneca B. S. & R. M.
Warwick	Burt, Thomas*	Warwick	Orange B. S.
Watertown	Cory, Henry S.*	LeRay	Jefferson L., B. S.
"	Gould, A	Watertown ?	"
"	Hunting, S. E.	Pamelis	B. S.
"	Phillips, Patrick*	"	"
"	Williams, E.	Watertown ?	"
Wawarsing	Hoornbeck, Charles*	"	"
West Troy	Mark, George*	Wawarsing	Ulster L.
West Walworth	Hanson, William	Glens Falls	Warren B. S.
West Winfield	Bradley, A. P.*	Walworth	Wayne
Whitfield	Barley, Albert*	Winfield	Herkimer L.
"	Dixon, Benjamin C.*	Rochester	Ulster L.
Whitehall	Adams, Terry	"	"
"	McLaughlin, John	Whitehall	Washington L.
Williamsville	Young, J. B. & F. H.*	"	B. S.
Willsboro Point	Frisbie, C. W.*	Williamsville	L. & B. S.
Wolcott	Post, Alonzo*	Willsboro	B. S.
"	Walker, Charles J.†	Butler	Essex L.
Wolcottville	Luckman, William J.*	"	Wayne R. S. & L.
		Royalton	Niagara L.
Sandstone			
Albany	Fuller's Son's Wm.*	New Baltimore	Greene B. S.
Albion	DeGraft & Roberts	Barre	Orleans B. S.
"	Garrett & Atkinson	"	B. S.
"	Goodrich & Clark Stone Co.	"	B. S.
Belfast	Lang, James	Belfast	B. S.

Belmont	Johnson, James	Amity	Allegany	B. S.
Belvidere	Dibble, Albert	"	"	B. S.
Canajoharie	Shaper, A. E.	Canajoharie	Montgomery	B. S.
Clayton	Wilber, S. H.	Clayton	Jefferson	B. S.
Cleveland, Ohio	Albion Stone Co.*	Barre	Orleans	R. M., B. S.
Clinton	Dawson, Charles	Kirkland	Oneida	B. S.
"	McCabe, John	"	"	B. S.
"	Moore, Richard	"	"	B. S.
Cooperstown	Wood, John	Middlefield	Otsego	B. S.
Corning	Bedient, James H.	Corning	Steuben	B. S.
"	Kelley, John	"	"	B. S.
Danville	Schubmehl, Martin J.*	Danville	Livingston	B. S.
Dormansville	Stewart, William	Westerlo	Albany	B. S.
East Guilford	Miller, Wm.†	Guilford	Chenango	B. S.
Elmira	Symonds, A. D.	Elmira	Chemung	B. S.
Fort Ann	Holmes, Andrew D.	Fort Ann	Washington	B. S.
"	Parish, Franklin	"	"	B. S.
"	White, Jenkins	"	"	B. S.
Fort Jackson	Downey Bros.	Hopkinton	St Lawrence	B. S.
Frankfort	Joslin, M. T.*	Frankfort	Herkimer	B. S.
Fulton	Granby Brownstone Co.	Granby	Oswego	B. S.
"	Jennings, Orvill J.	Volney	"	B. S.
Goodyears	Barger, J. G.†	Genoa	Cayuga	B. S.
Grand View	Brown, Wm. H.	Orangetown	Rockland	B. S.
Hammoud	Finegan, John C.*	Hammoud	St Lawrence	B. S., F.
"	Foster, H. A.	"	"	B. S.
"	Parmeter, D. E.	"	"	B. S.
"	Stanley, W. H.	"	"	B. S.
Haverstraw	Demarest, P. E.	Haverstraw	Rockland	B. S.
Highland	Clearwater, F. S.	Lloyd	Ulster	B. S.
Himrod	Cheney, Louis A.*	Himrod	Yates	B. S.
Hindaburg	Baldwin & Hinds	Murray	Orleans	B. S.
"	Burns, L. G.	"	"	B. S.
"	Chadwick Bros.	"	"	B. S.
"	Chadwick, Thos. Jr.	Murray	"	B. S.
Holley	Downs & Bowman†	Clarendon	"	B. S., F.
"	O'Brien & Co.	Murray	"	B. S.
Hornellsville	Cobb, J. F.	Hornellsville	Steuben	B. S.
Hulburton	Fancher & Newsome*	Murray	Orleans	B. S., F.

DIRECTORY OF QUARRYMEN IN NEW YORK STATE — SANDSTONE — (Continued).

POST-OFFICE ADDRESS	NAME	LOCATION OF QUARRY	
		Town or village nearest to the quarry	County
Enlburton	Ford A. H.	Murray	Orleans
"	Gwynne, C. F.	"	B. S.
"	Hamilton Chas. J.	"	B. S.
"	Hebner, John	"	B. S.
"	Lardner, Thomas	"	B. S.
"	Phillips, Marcus	"	B. S.
"	Squire, A. J.	"	B. S.
"	Sturaker & Sullivan	"	B. S.
"	Von York, Constantin	"	B. S.
Ithaca	Fowles, Joseph *	Ithaca	Tompkins
"	Mc. Clune, G. C. †	"	R. M., B. S.
Jamestown	McVeigh, John	Ellicott	B. S.
Lewiston	Hotchkiss, L. W.	Lewiston	Chautauqua
Lookport	Kinney, Rebecca	Lookport	B. S.
"	Spalding Wm.	"	B. S.
"	Whitmore, Chas. *	"	B. S.
Malden	Ulster Bluestone Co. *	Quarryville	R. M., B. S.
Malone	Bashaw, Levi	Malone	B. S. & F.
"	Morris, Antoni	"	B. S.
"	Paddock, S. A.	"	B. S.
Medina	Garrett, Thos.	Ridgeway †	Orleans
"	Gorman, Chas. A. *	Murray, Barre, Ridgeway	B. S. & F.
"	"	Barre	B. S.
"	Gorman & Storck	"	B. S.
"	Gotts & Storck	"	B. S.
"	Horan, Patrick	Ridgeway	B. S.
"	Horan, Mrs. S. J.	"	B. S.
"	Kearney & Barrett	"	B. S.
"	McCormick, A. J.	"	B. S.
"	Mooney Bros.	"	B. S.

Medina.....	Noble & Lyle.....	Ridgeway.....	Orleans.....	B. S.
".....	O'Reilly, Bernard.....	Murray.....	".....	B. S.
".....	Scanlon, Martin.....	Barre.....	".....	B. S.
".....	Slack, Michael.....	Murray.....	".....	B. S.
".....	Stark, Joseph.....	Ridgeway.....	".....	B. S.
".....	Swett, A. L.*.....	Medina.....	".....	B. M., B. S.
".....	Wall, Wm. H. Sup't Holloway Quarries†.....	Ridgeway.....	".....	B. S.
Middleburg.....	Bishop, Amberson.....	Middleburg.....	Schoharie.....	B. S.
Monroe.....	Davison, John G.*.....	Monroe.....	Orange.....	B. S. & F.
New Hudson.....	Searle, Mr.....	New Hudson.....	Allegany.....	B. S.
North Cohocton.....	Whitney, Theo.....	Cohocton.....	Steuben.....	B. S.
Nyack.....	Puff, Nelson.....	Orangetown.....	Rockland.....	B. S.
".....	Smith, Dan F.....	".....	".....	B. S.
Olean.....	Olean Bluestone Co.....	Olean.....	Cattaraugus.....	B. S.
Olive.....	Bogart, E. H.*.....	Olive.....	Ulster.....	B. S. & F.
Oswego Falls.....	Faulkner, James.....	Granby.....	Oswego.....	B. S.
Oxford.....	Burns, Edward.....	Oxford.....	Chenango.....	B. S.
".....	Clark Bluestone Co. F. G.*.....	".....	".....	B. S. & F.
".....	Coman, Wm.*.....	".....	".....	B. S. & F.
".....	Hogan & Britt.....	".....	".....	
".....	Johnston & Kertauer.....	".....	".....	
".....	Keeley Bros.....	".....	".....	
".....	Oldfield, James.....	".....	".....	
".....	Woods, Theodore.....	".....	".....	
".....	Young, Richard.....	".....	".....	
Penn Yan.....	Cornwell, Geo. R.....	Milo.....	Yates.....	B. S.
Portageville.....	Genesee Valley Bluestone Co.*.....	Genesee Falls.....	Wyoming.....	B. S.
Port Henry.....	Bond, L. W.....	Moriah.....	Essex.....	B. S.
Potsdam.....	Clarkson Quarries*.....	Potsdam.....	St Lawrence.....	B. S. & F.
".....	Merritt & Tappan.....	".....	".....	B. S.
".....	Potadam Red Sandstone Co.....	".....	".....	B. S.
Berford Flats.....	Benedict, Levi.....	Aqueduct.....	Schenectady.....	B. S.
Rochester.....	Brady, Gilbert.....	Albion.....	Orleans.....	B. S.
".....	Brown, Henry S.....	Rochester†.....	Monroe.....	
Rockville.....	Searl, Abram.....	Belfast.....	Allegany.....	B. S.
Saugerties.....	Burians & Brainard.....	Saugerties.....	Ulster.....	B. S. & F.
Schenectady.....	Shear, Albert & Co.*.....	Aqueduct & Duaneburg.....	Schenectady R. M., B. S.	
Shelby Basin.....	LeValley, John*.....	Ridgeway.....	Orleans.....	B. S. & F.
South Berne.....	Bailey, David*.....	Westerlo.....	Albany.....	F.

DIRECTORY OF QUARRYMEN IN NEW YORK STATE — SANDSTONE — (Continued).

POST OFFICE ADDRESS	NAME	LOCATION OF QUARRY	
		Town or village nearest to the quarry	County
South Hammond.....	Seymour & Edgar.....	Hammond.....	St Lawrence B. S.
St Johnsville.....	Smith, W. C.....	St Johnsville.....	Montgomery
Trumansburg.....	Biggs, D. S. & Sons.*.....	Utica.....	Tompkins B. S. & F.
Utica.....	Conley, F. E.*.....	Higginsville.....	Oneida R. M. & B. S.
Warsaw.....	Warsaw Bluestone Co.....	Rock Glen.....	Wyoming B. S.
Washington Mills.....	Griffiths, Wm.....	New Hartford.....	Oneida B. S.
".....	Mallory, J. P.....	".....	" B. S.
".....	Thompson, E. F.....	".....	" B. S.
Watkins.....	Trimbey, H. J.*.....	".....	" B. S.
Wat's Flats.....	Higgins, D. H.*.....	Dix.....	Schnyder B. S.
Waverly.....	Gould Fred H.*.....	Harmony.....	Chautauqua B. S.
".....	Bogert, M. L.....	Barton.....	Tioga B. S.
".....	Fleckenstine, J. W.....	".....	".....
".....	Murray, John H.....	".....	".....
Whitehall.....	McLaughlin, John.....	Whitehall.....	Washington B. S.

Bluestone

Bluestone is a variety of sandstone, which, by reason of its even texture can be cut or sawed into any desired form and is therefore peculiarly available for house trimmings of various kinds. In general, the layers in the quarries vary from an inch to several feet in thickness; the thinner of these are used for flag stones and the thicker are cut into dimension stone for building purposes.

The bluestone industry is chiefly located in Ulster county and the quarries are almost innumerable but the business is controlled by a few large dealers who are located at points favorably situated for shipment and who, to a considerable extent, buy stone from the men who quarry it. Bluestone is also produced in the counties of Albany, Greene, Sullivan, Delaware and Chenango in Eastern New York and in Cattaraugus and Wyoming counties in Western New York.

The geological horizon of the commercial bluestone is very near the dividing line between the Hamilton and Portage groups. It is, however, not usually possible to determine in which of these groups a given quarry belongs owing to the great scarcity of fossils.

* PRODUCERS OF BLUESTONE

POST OFFICE ADDRESS	NAME	Town or village nearest to the quarry
Albany county		
Reidsville.....	Otto Bennet*.....	Berne F.
South Berne.....	Bailey, David*.....	Westerlo F.
Cattaraugus county		
Olean.....	Olean Bluestone Co.....	Olean B. S.
Chenango county		
Oxford.....	Clarke Bluestone Co. F. G.....	Oxford B. S.
Tyner.....	Loomis, Perry*.....	Smithville B. S.
Delaware county		
Fish's Eddy.....	Martin, Geo.....	Hancock B. S., F.
Hales Eddy.....	Kingsbury, O. M. & Co.*.....	Tompkins F.
Hamden.....	Kenny, James*.....	Hamden
Hancock.....	Cotter Bros.*.....	Hancock
".....	Kirkpatrick Bros.....	"
Long Eddy.....	Kenny Bros.....	"
".....	Peak, Cyrus*.....	" F.
Lordville.....	Curry, John.....	"
Peakville.....	Merritt, Geo. W.*.....	" B. S., F.
".....	Staib, J. J.....	"
Rock Rift.....	Huntington, E.....	Tompkins
Steckport Station.....	Morse, J & Co.....	Hancock
Walton.....	Gray & Marvin*.....	Walton
".....	St John, H. E.*.....	"
".....	Warner, G. T.*.....	" B. S., F.

* PRODUCERS OF BLUESTONE — *concluded*

POST OFFICE ADDRESS	NAME	Town or village nearest to the quarry
Greene county		
Palenville.....	Lamouree, F. & Co.*.....	Catskill F.
".....	Newkirk, Isaac*.....	"
Sullivan county		
Callicoon.....	Persbacher Bro's & Co.*.....	Callicoon B. S., F.
Callicoon Depot.....	Dering, John.....	"
Hankins.....	Manny, Anthony*.....	Fremont B. S., F.
Long Eddy.....	Dunn & Co.....	"
Narrowsburg.....	Engelman, Geo. W.....	Tusten
Roscoe.....	Gragg & Miller.....	Rockland
Ulster county		
Allaben.....	McGregor, S.....	Shandaken
Brodhead.....	Hungerford, Alonzo.....	Olive
".....	Lyons L.....	"
Glenford.....	Burton, H.....	"
".....	Krom, Wm.....	"
Hurley.....	Ostrander, Samuel.....	Hurley
Kingston.....	Roger & Tappan, dealers only..	"
Lomontville.....	Dunn, Patrick.....	Marbletown
".....	Rose, Andrew.....	"
Malden.....	Ulster Bluestone Co.*.....	Quarryville B. S., F.
Marbletown.....	Clearwater, Jacob.....	Marbletown
".....	De Graff, Wm.....	"
Olive.....	Bogart, E. H. t.....	Olive F.
Olive Bridge.....	Gemmell, James B.....	" F.
Phoenicia.....	Simpson, A. J.....	Phoenicia
Plattekill.....	Longendyke & Co.....	Plattekill
".....	Sheffell, F. & Co.....	"
Quarryville.....	Carnwright, Alphonso.....	Saugerties
".....	Fitzpatrick, Daniel.....	"
Rondout.....	Boice, Hewitt, dealer only.....	"
Sawkill.....	Peppard, Michael*.....	Kingston B. S.
".....	Walsh, Wm. & Sons*.....	" B. S.
Stone Ridge.....	Turner, C. C.*.....	Marbletown
Stony Hollow.....	Cassidy, Owen.....	Kingston
".....	Murtha, Michael.....	"
West Hurley.....	Connors, Thomas*.....	Hurley
West Saugerties.....	Carn, J. & Sons.....	Saugerties
West Shokan.....	Boice, Lemuel.....	Olive
Wilbur.....	Osterhoudt, Julius*.....	Kingston B. S., F.
Woodstock.....	Lasher, D.*.....	Woodstock F.
Wyoming county		
Portageville.....	Warsaw Bluestone Co.....	Gainesville B. S.
".....	Genesee Valley Bluestone Co...	Genesee Falls B. S.

* For a complete list of all persons engaged in quarrying bluestone see Bulletin No. 15, New York State Museum.

The foregoing directory of quarries and quarrymen, while probably not complete is very nearly so. As already indicated in the chapter on road materials, only a part of the quarries yield stone which is entirely satisfactory for road building. The reports of the Massachusetts Highway Commission, however, show that where the best material is not obtainable, other material can be put to a very good use, and a sandstone may make a very satisfactory foundation, when covered with trap or even with limestone, if nothing more desirable is available. Roads built in this way probably require more engineering skill in their construction and more careful watching in maintenance and repair. The local problems must be worked out in the future by actual experiment under the supervision of competent road engineers.

PLATE I.

**MASSACHUSETTS HIGHWAYS.**

PLATE II.

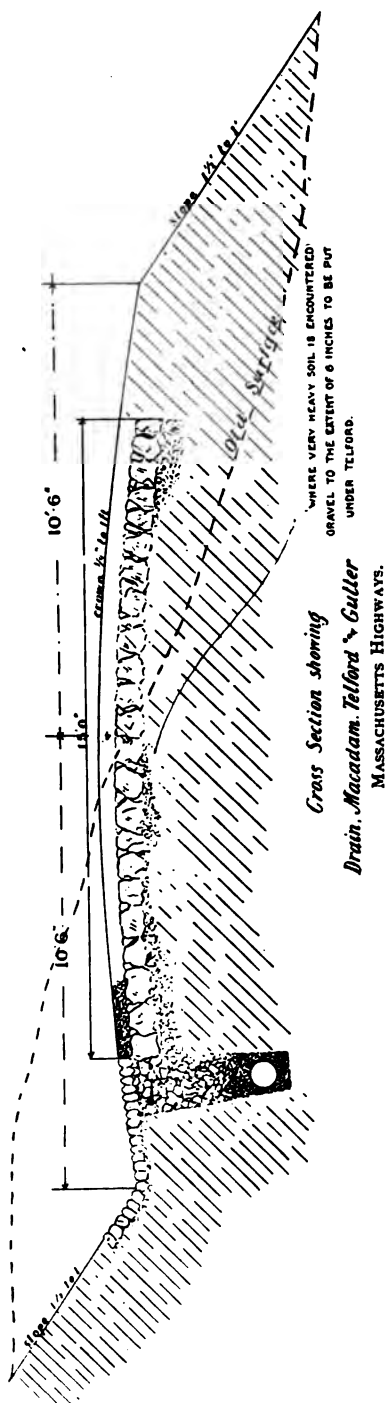
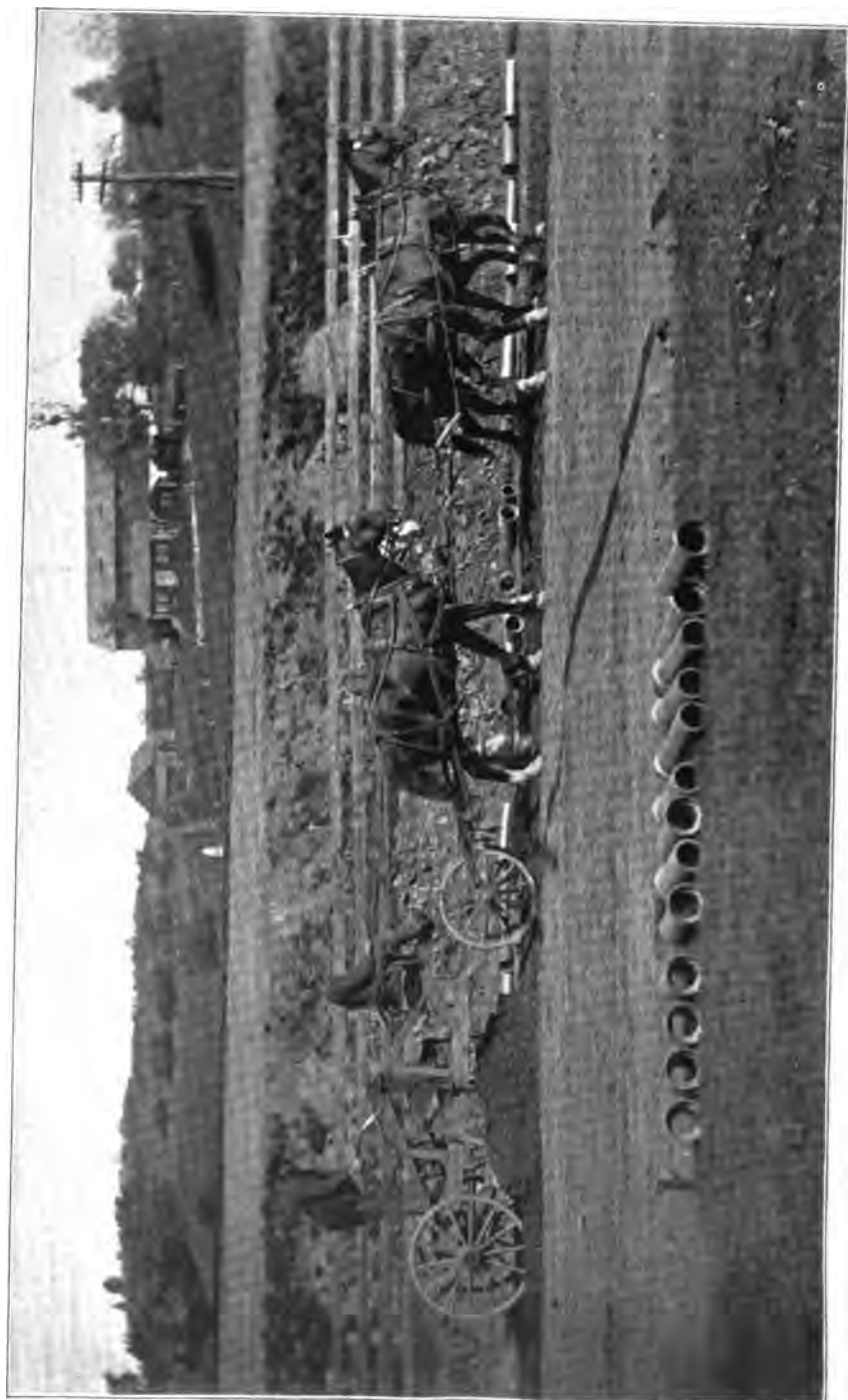


PLATE III.



WESTFIELD ROAD, MASS., 1894.
View showing the road machine at work grading the sub-grade.

PLATE IV.



WESTFIELD ROAD, MASS., 1894.
View showing the method of constructing a drain in clay or other wet soil.

PLATE V.



WESTFIELD ROAD, MASS., 1894.
View showing details of drain.

Digitized by Google



PLATE VI.



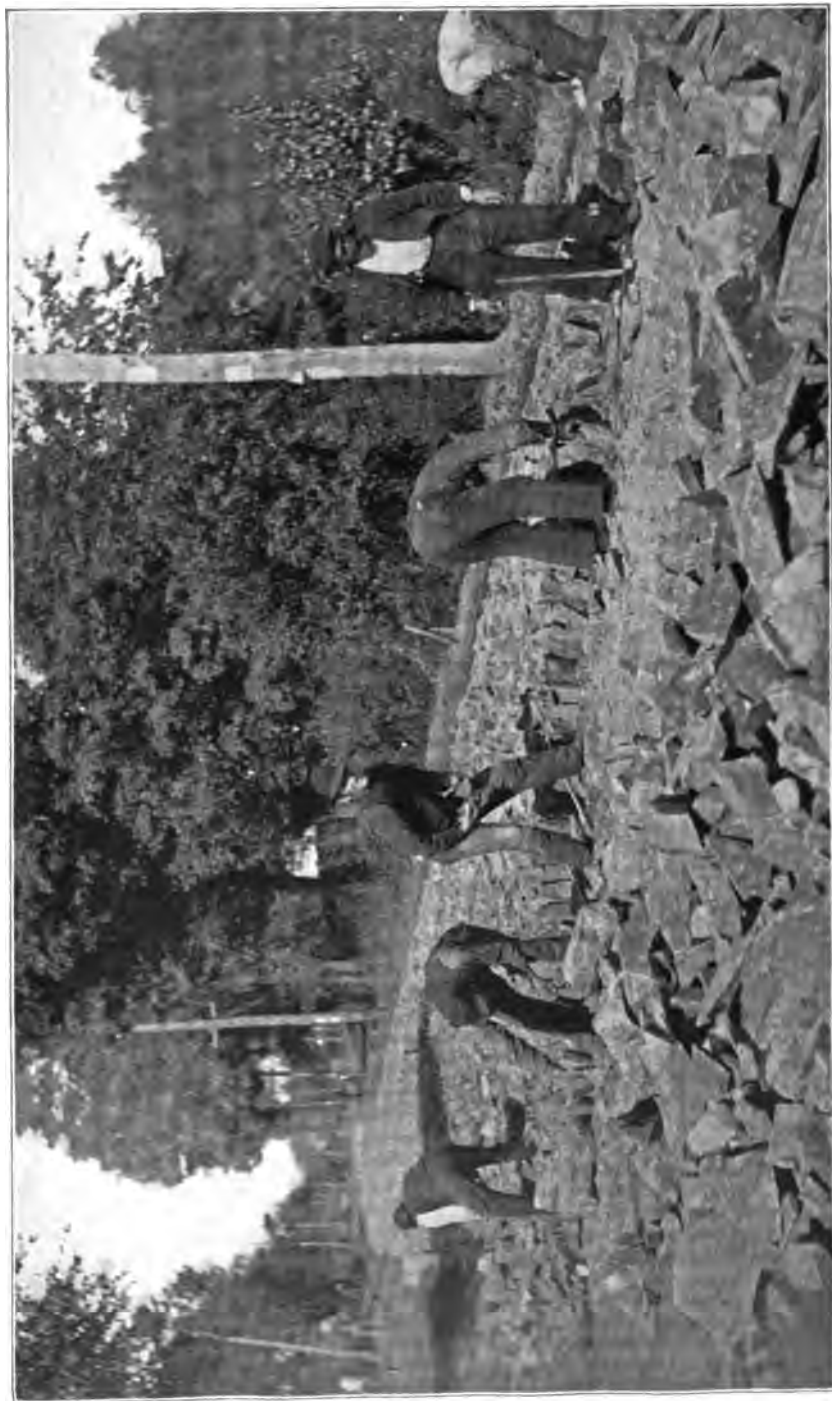
WESTFIELD ROAD, MASS., 1864.
View showing sub-grade graded and rolled, also the broken stone in place.



PLATE VII.



WESTFIELD ROAD, MASS., 1894.
View showing sub-grade graded and rolled, also the broken stone being put in place and steam roller at work



WESTFIELD ROAD, MASS., 1894.
View showing method of laying Telford foundation on a gravel bed.



WESTFIELD ROAD, MASS., 1894.
View showing Telford road in process of construction.



WESTFIELD ROAD, MASS., 1894.
View showing the finished roadway, together with steam roller at work.

PLATE XI.



WESTFIELD ROAD, MASS., 1894.
View showing completed road.



PLATE XII.



WESTFIELD ROAD, MASS., 1894.
View showing completed road.



WESTFIELD ROAD, MASS., 1894.
View showing completed road with guard rail.





WESTFIELD ROAD, MASS., 1894.
View showing completed road with bridge and guard rail.

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